



The Science of a Healthier Life®

MAY/JUNE 2022

FEATURE ARTICLES

- 18 Defend Against Allergies-Flu-Colds
- 28 Improve Symptoms of Brain Fatigue
- 46 Restore Healthier Glucose Levels
- 56 Danger of Elevated Homocysteine
- 74 Vitamin K Research Update
- 78 Walnuts Extend Human Lifespans



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Linked to
Longer Life

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Take **one capsule 30-60 minutes** before bedtime.



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References

1. *Sleep Med.* 2020;72:28-36.



Item #02502

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*European Journal of Nutrition. 2011;50(5):387-389.



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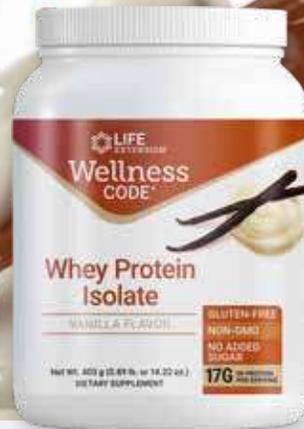
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Whey fractions help modulate a full range of healthy bodily functions.

References

1. *Int J Gen Med.* 2011 Jan 25;4:105-13.
2. *Br J Nutr.* 2000 Nov;84 Suppl 1:S81-9.
3. *J Dairy Sci.* 2000 Jun;83(6):1187-95.

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REPORTS

36 ON THE COVER

TARGET BELLY FAT

Two **plant extracts** reduced **waist circumference** by an average of **4.7 inches** and **hip size** by an average of **4.1 inches** in clinical trials.



18 BOOST DEFENSES AGAINST COLDS, FLU, AND ALLERGIES

Scientists have identified a **probiotic** and **yeast fermentate** combination that **reduced cold** and **flu** frequency by **55%** and **reduced** days with nasal congestion by **43%**.

28 A SOLUTION FOR BRAIN FOG

Two plant extracts restore **mental clarity**, energy, and **focus**.

46 RESTORE HEALTHIER GLUCOSE LEVELS

Cinnamon, chromium, amla, shilajit, and seaweed help reduce **blood glucose** levels.

56 OVERLOOKED RISKS OF ELEVATED HOMOCYSTEINE

High **homocysteine** blood levels contribute to cerebrovascular disease, brain aging, and hearing loss. A simple blood test and specific **B vitamins** can safely lower homocysteine.

66 MOTIVATION MATTERS FOR LONGER LIFE

Staying **motivated** is essential for staying healthy well into older age. Some keys to achieve this are passionate attitude, community support, eating healthy foods, and adequate sleep.

74 RESEARCH UPDATE: VITAMIN K

Recent studies continue to show the benefits of **vitamin K1** and **K2**. Vitamin K impedes arterial calcification, protects cognitive function, and reduces all-cause mortality.

78 HARVARD: EATING WALNUTS EXTENDS HUMAN LIFESPANS

Harvard scientists recently found that 60-year-olds who ate **five** weekly servings of walnuts had a **1.3-year** increase in lifespan. Walnuts may protect against diabetes, cancer, and Alzheimer's.

DEPARTMENTS

10 IN THE NEWS

Eating fish lowers vascular brain disease; overweight people urged to screen for diabetes starting at age 35; vitamin D deficiency linked to worse outcomes after hip-fracture surgery, Magnesium can improve blood glucose metabolism; an anti-inflammatory diet may reduce dementia risk; modestly elevated A1c raises risk of cardiovascular disease and overall mortality; L-arginine helps improve erectile dysfunction and more.



88 AUTHOR INTERVIEW

Investor-author **Sergey Young** provides practical and innovative steps to help people live long enough to take advantage of breakthrough longevity technologies when they become available.



97 SUPER FOODS

Studies show that **dandelion** extract may combat constipation, dramatically reduce cholesterol and triglyceride levels, and protect skin cells against aging and UV light.



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May/June 2022

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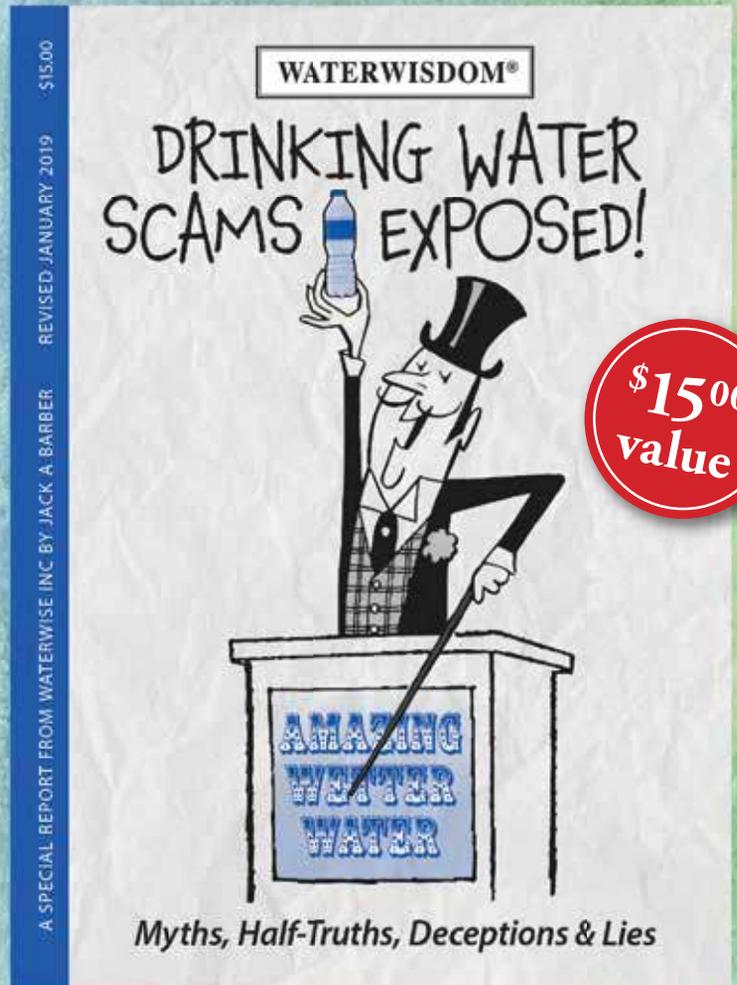
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In the News

Eating More Fish Linked to Benefits for the Brain

People who eat higher amounts of fish have lower vascular brain disease, according to a study published in *Neurology*.^{*} Vascular brain disease, which involves damage to the brain's blood vessels, increases the risk of vascular dementia and stroke.

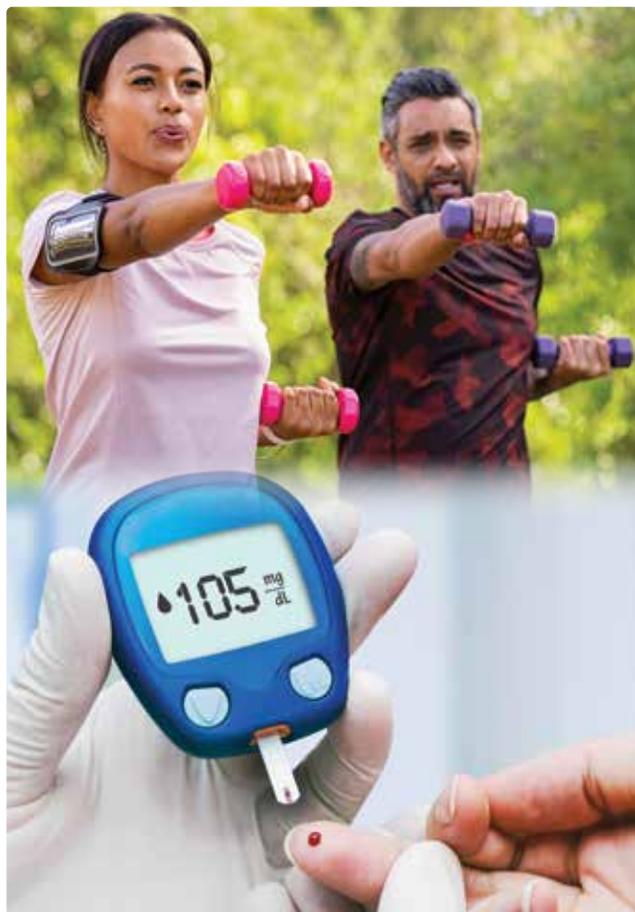
Researchers analyzed MRI brain scans of 1,623 people 65 and over who had no history of stroke, cardiovascular disease, or dementia. The individuals also filled out dietary questionnaires.

Participants who ate the most fish had fewer signs of blood vessel disease in their brains compared to those who ate it less frequently.

Editor's Note: This association was strongest in people ages 65-69, compared to older individuals in the study.

^{*} *Neurology*. 2021 Nov 30;97(22).





Diabetes Screening Age Lowered from 40 to 35 for Overweight and Obese People

The U.S. Preventive Services Task Force has lowered the age at which overweight and obese people should begin screening for diabetes from 40 to 35, a recommendation statement in *JAMA* urged.*

According to the Task Force, there is a spike in the prevalence of both diabetes and prediabetes around age 35.

Lowering the screening age from 40 to 35 could help identify people with prediabetes and give them time to prevent full-blown diabetes by adopting a healthier diet, exercising more, and losing weight, the Task Force stated.

Editor's Note: "Diabetes is the leading cause of kidney failure and new cases of blindness among adults in the U.S.," the statement noted.

* *JAMA*, 2021;326(8):736-743.

Curcumin for Inflammatory Bowel Disease

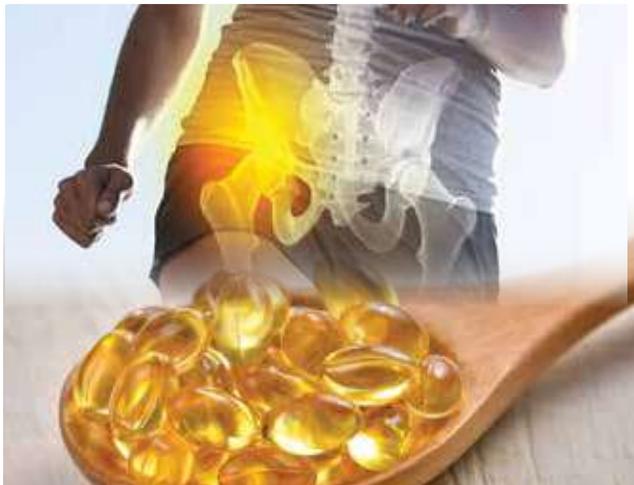
Patients with inflammatory bowel disease who received curcumin experienced improvements, compared with those getting a placebo, a meta-analysis published in *Complementary Therapies in Medicine* found.*

Pooled analysis of the participants' data revealed an increase in clinical remission for those taking curcumin, compared to controls. This remained significant among patients aged 40 years and older. In two studies that reported changes in clinical symptoms, improvement was also observed in curcumin-treated participants.

Editor's Note: Additionally, among the six studies in which participants underwent endoscopy, endoscopic remission in participants treated with curcumin significantly increased among those 40 years of age and older.

* *Complement Ther Med*. 2021 Oct 29;63:102787.





Higher Vitamin D Pre-Op Levels Aid Recovery from Hip-Fracture Surgery

A study reported in the *Journal of Bone Metabolism* revealed an association between deficient vitamin D levels and diminished functional recovery with prolonged hospitalization among men and women who underwent surgery for hip fracture.*

The study included 1,029 individuals aged 65 years or older with a hip fracture that required surgery. Measurement of 25-hydroxyvitamin D levels upon hospital admission revealed vitamin D deficiency among 702 patients.

The average length of hospitalization was 27.7 days among patients with vitamin D deficiency compared to 20.9 days among those whose levels were considered sufficient.

Vitamin D deficiency was significantly associated with:

- **1.52** times greater odds of developing postoperative delirium, and
- **2.41** times greater odds of developing a blood clot.

Editor's Note: Patients with vitamin D deficiency were also found to have greater odds of postoperative pneumonia compared to those who had sufficient levels.

* *J Bone Metab.* 2021 Nov;28(4):333-338.

Increased Ergothioneine May Prevent Neurodegeneration

Low levels of the amino acid **ergothioneine** have been associated with cognitive decline and could serve as an early warning sign of cognitive impairment, according to research published in the journal *Free Radical Biology and Medicine*.*

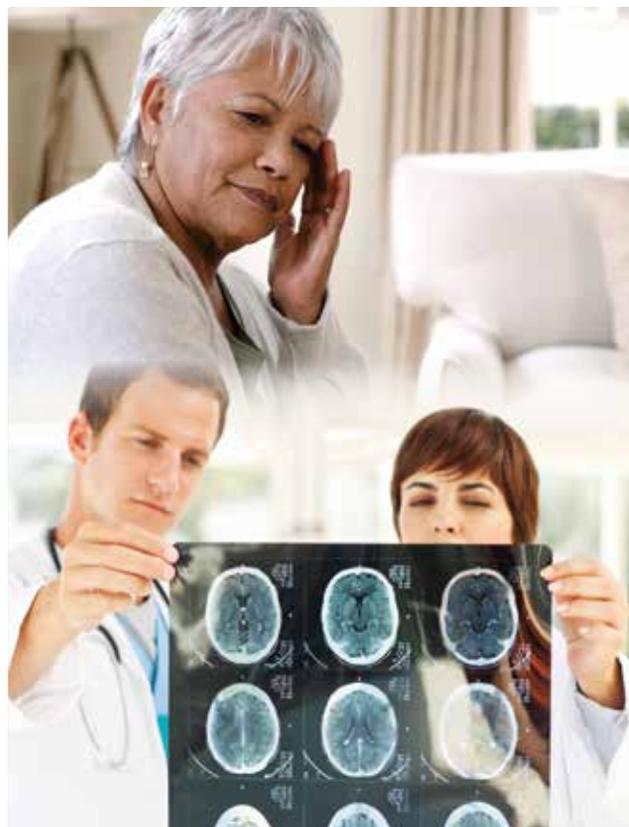
Results of the 496-participant study showed that plasma ergothioneine levels were **lowest** in dementia patients, and only intermediate levels were found in people with cognitive impairment.

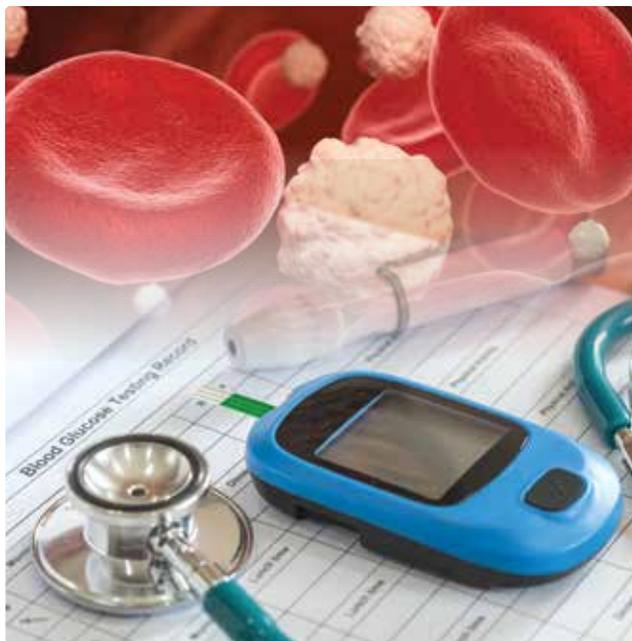
In multivariate analyses, lower levels of ergothioneine were *significantly associated* with dementia and cognitive impairment.

Editor's Note: Additionally, researchers noted that lower ergothioneine levels

“were also associated with white matter hyperintensities and brain atrophy markers (reduced global cortical thickness and hippocampal volumes).”

* *Free Radic Biol Med.* 2021 Dec;177: 201-211.





Magnesium Supplementation Can Improve Blood Glucose Metabolism

Magnesium supplementation may help improve blood glucose metabolism among people with diabetes and those who are at high risk of developing the disease, according to findings from a meta-analysis of clinical trials reported in *Nutrients*.*

Researchers analyzed 13 randomized trials that evaluated magnesium supplementation's effects on glucose metabolism among diabetics. Twelve trials were additionally selected that evaluated magnesium among participants at high risk of developing the disease.

Compared to a placebo, supplementing with magnesium was associated with significantly lower fasting plasma **glucose** levels in trials that included diabetic participants.

In trials that included people at risk of diabetes, magnesium was significantly associated with lower fasting plasma **glucose** and improved insulin sensitivity.

Editor's Note: Conditions that categorized participants as having a high risk of diabetes included being overweight or having prediabetes, metabolic syndrome or other disorders.

* *Nutrients*. 2021 Nov 15;13(11):4074.

Anti-Inflammatory Diet May Protect Against Dementia

The journal *Neurology*[®] reported an association between greater adherence to an anti-inflammatory diet and a lower risk of dementia.*

The study included 1,059 participants with an average age of 73 years who were free of dementia on enrollment. Dietary questionnaire responses provided information concerning food groups consumed during the previous month. Higher diet scores indicated a greater intake of proinflammatory foods and fewer servings of fruit, vegetables, beans, tea and coffee.

During the three-year follow-up, **6%** of the participants developed dementia. The researchers determined that each one-point increase in dietary inflammatory score was associated with a **21%** increase in dementia, and that participants in the highest third of dietary scores had a **three times greater** risk of dementia compared to participants whose scores were among the lowest third.

Editor's Note: Participants with the lowest third of dietary scores, indicative of the least inflammatory diet, consumed a weekly average of **20** servings of fruit, **19** servings of vegetables, **four** servings of legumes and **11** servings of coffee or tea per week.

A pro-inflammatory inducing diet includes foods cooked at **high temperature** and excess consumption of **omega-6** fats in relation to **omega-3s**.

Safe (low temperature) ways to cook foods include poaching, boiling, stewing, and steaming.

Dangerous (high temperature) cooking methods include frying, grilling, barbecuing, and roasting.

* *Neurology*. Dec 2021, 97 (24) e2381-e2391.





Modestly Elevated A1c Raises Risk of Cardiovascular Disease

Elevated hemoglobin A1c levels, which are determined by a simple blood test, are associated with increased risk of cardiovascular disease and mortality, according to a study published in *Cardiovascular Diabetology*.*

Researchers used data from six prospective population-based studies including 36,180 people with and without type II diabetes, with a median follow-up of 9.9 years.

The results found that individuals with **A1c** levels above 5.5% had a **higher** risk of **cardiovascular disease** incidence.

Those with an **A1c** above 5.7% had a **higher** risk of **overall mortality**.

Participants with an **A1c** above 5.8% had a **higher** risk of **cardiovascular mortality**.

Note that an A1c of **5.5%** is the upper range of “normal” on **blood test** reports.

This study on modestly elevated **A1c** corroborates the benefits of optimizing one’s A1c. Health-conscious people should target their **A1c** below 5.0%-5.5%.

Editor’s Note: HbA1c levels are used to measure *diabetes* risk, but this study showed the correlation with *cardiovascular* risk as well.

* *Cardiovasc Diabetol*. 2021 Nov 15; 20(1):223.

L-Arginine Helps Improve Erectile Dysfunction

The *Journal of Endocrinological Investigation* published the findings of a recent trial confirming a benefit for supplementation with the amino acid **L-arginine** for men with mild to moderate erectile dysfunction (ED).*

Fifty-one men received **six grams** of L-arginine per day for three months, and 47 men received a placebo. Questionnaires administered at the beginning and end of the study evaluated erectile function. Ultrasonographic examinations of the penis conducted at these times obtained measurements of penile cavernous arterial peak systolic flow velocity (PSV).

Men who received L-arginine had significant improvement in their questionnaire scores, while scores among the placebo group were unchanged. ED category improved among **74%** of treated participants and **24%** achieved scores indicating an absence of the condition.

Editor’s Note: The trial included men with vasculogenic ED, which occurs when arteries and/or veins that deliver blood to and from the penis malfunction.

* *J Endocrinol Invest*. 2022 Jan 1.





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BOOST DEFENSES



Against Colds, Flu, and Allergens

BY MICHAEL DOWNEY

Millions of Americans suffer from **colds, flu,** and seasonal **allergies** every year.

Medications only target the *symptoms* but don't address the underlying causes.

Scientists have discovered two unique ingredients—a dried **yeast fermentate** + a **probiotic**—that help prevent these symptoms *and* reduce their severity and duration if they do occur.

Clinical studies show that supplementation with a dried **yeast fermentate** resulted in:^{1,2}

- Increases in **secretory IgA** levels, an antibody that provides mucosal immune defense against viruses and bacteria, and
- Increases in **natural killer cell** activity that destroys infected cells.

In a clinical study, the use of the **probiotic *L. rhamnosus* CRL1505** resulted in:³

- **47%** higher levels of secretory **IgA levels,**
- **55%** fewer cold and flu occurrences, and
- **46%** fewer cases of fever.

Together, these ingredients work in multiple ways to enhance **immune defenses** and dramatically reduce the number of cold, flu and allergy occurrences.

More Than a Nuisance

Seasonal **allergies** affect about **30%** of American adults.⁴ They have also been associated with more serious conditions, including asthma, and sinus and ear infections.^{5,6}

American adults also average **two to three colds** annually.⁷ They can strike any time of year, and the nasal congestion that comes with them may cause worrisome **secondary bacterial infections**.⁸

Influenza causes **thousands** of U.S. deaths in a typical year.⁹ Those over 65 are most at risk for severe disease and complications.¹⁰

Preventing and Limiting Symptoms

Medications can provide temporary relief for cold, allergy, and flu symptoms, but they do nothing to *prevent* them.

Side effects of these drugs can include drowsiness, constipation, headache, rapid heartbeat, and sleep problems.¹¹ Certain allergy drugs, known as **anti-cholinergics**, have been linked to an increased risk of Alzheimer's disease.¹²

Scientists have identified two ingredients that help **prevent** cold and flu episodes.^{3,13,14}

These ingredients are:

- A dried **yeast fermentate**, and
- A probiotic strain called ***Lactobacillus rhamnosus* CRL1505**.

Each of these ingredients boosts activity of **immunoglobulin A (IgA)**, an antibody that provides immune defense against **viruses** and **bacteria**.^{1,3}

Additionally, supplementation with dried yeast fermentate offers relief for people with allergies.¹³

The Discovery of Yeast's Immune Benefits

The immune benefits of **yeast fermentate** were discovered purely by accident.

A company in Cedar Rapids, Iowa was producing a specialized **yeast** culture when it became clear that its factory workers—exposed daily to the yeast through inhalation—were using far fewer sick days than the office workers.

Scientists investigated and found that, compared to the office staff, factory personnel had significantly **higher** levels of the antibody **secretory IgA**. Secretory IgA is known to block pathogens from penetrating mucosal surfaces.¹⁵

They also had increased activity of **natural killer**





cells, which can destroy cells infected by **viruses**.¹⁶

The company went on to develop the dried fermentate using a proprietary fermentation process and **baker's yeast**. Six placebo-controlled **clinical trials** have since validated its ability to protect against colds, flu, and allergies.^{1,2,13,14,17,18}

Yeast's Allergy Defense

Scientists conducted a pilot study on 25 healthy individuals, giving them either a **placebo** or **500 mg** of dried **yeast fermentate** daily for five weeks at the start of allergy season.¹

Several in the **yeast** group saw clear improvements. About **a quarter of those who received the yeast** reported a **complete absence** of allergy symptoms, which returned within two weeks after they stopped taking the yeast fermentate.¹

Seasonal allergies did *not* change in the **placebo** group.

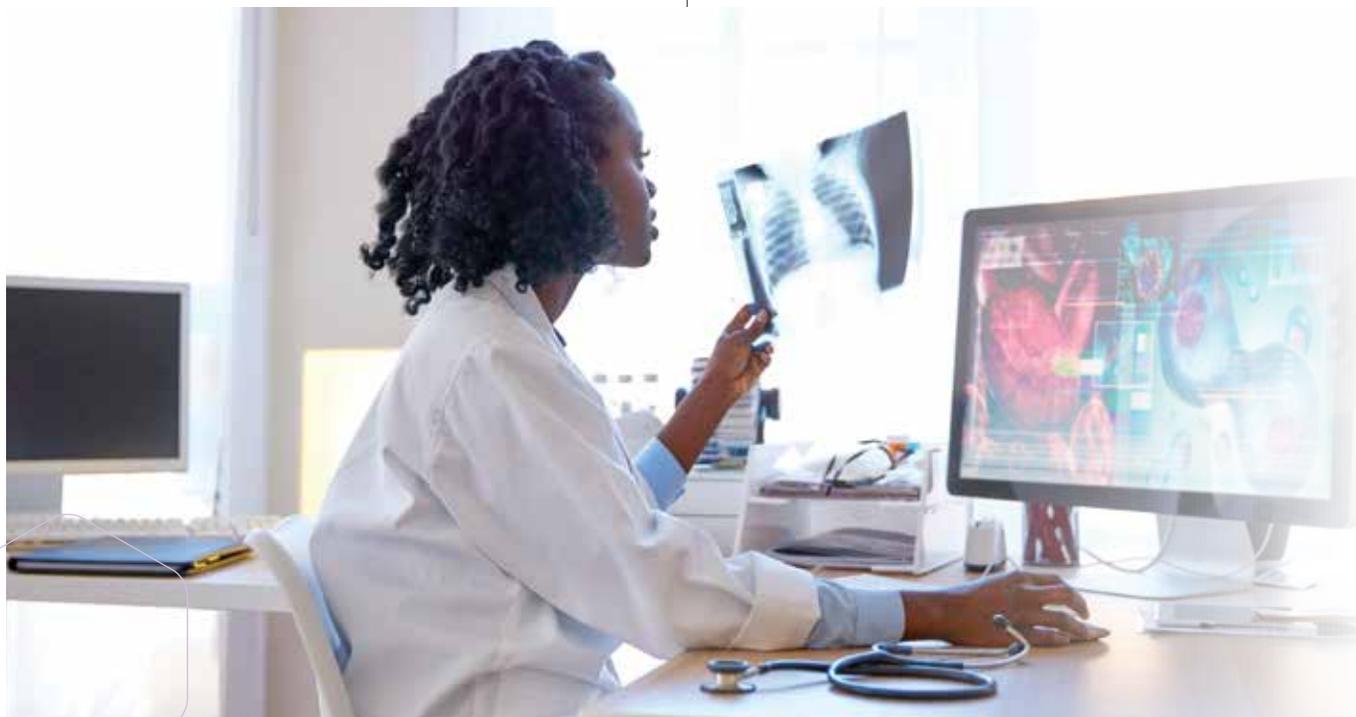
Researchers then conducted a clinical study of people with a history of seasonal allergies and hay fever. Participants took either a placebo or **500 mg** of dried **yeast fermentate** once daily.¹³

The first half of the 12-week study took place during the year's highest pollen-count period. Compared to the placebo group, those taking yeast had a median of **43% fewer days** with **nasal congestion**, along with decreased *severity* of runny nose and nasal congestion.¹³

WHAT
YOU
NEED
TO
KNOW

Protect Against Allergies, Colds, and Flu

- In a human study, taking **500 mg** of dried **yeast fermentate** daily decreased seasonal **allergy** symptoms, leading to **43%** fewer days with nasal congestion. The same dose also reduced **cold** or **flu**-like symptoms.
- The probiotic strain *Lactobacillus rhamnosus* **CRL1505** decreased the frequency, severity, and duration of **cold** and **flu** symptoms in a clinical trial. Over six months, it led to **49%** fewer infections, **55%** fewer cases of cold and flu, and **46%** fewer cases of fever.
- Combining these two ingredients is a safe and effective way to reduce the misery caused by colds, flu, and allergies, all year long.



Yeast Fermentate's Cold and Flu Protection

Scientists conducted two clinical studies to test the yeast fermentate's effect on **cold** and **flu-like** symptoms.

In one, they gave a daily dose of **500 mg** of the **dried yeast fermentate** to 116 individuals with a mean age of 37. The trial was conducted from January through March, peak cold and flu season.

At the end of 12 weeks, compared to the placebo group, the yeast-treated group had experienced a **13% reduction** in cold or flu-like symptoms. These included headache, fever, general aches and pains, fatigue, nasal stuffiness, sore throat, cough, and chills.¹⁷

The other study was virtually identical, except that the participants were an average age of 44. The yeast-treated group had an **11% reduction** in the incidence of cold or flu-like symptoms and a **17% reduction** in the *duration* of symptoms.¹⁴

How Yeast Fermentate Works

Allergy symptoms affect the eyes, nose, throat, lungs, or skin. They are chiefly caused by antibodies called **immunoglobulin E (IgE)**, which trigger the body's release of chemicals such as **histamine** that cause these reactions.

In the pilot study that first showed **yeast fermentate's** ability to relieve allergy symptoms, blood levels of **IgE** *increased* among placebo recipients as allergy season went into full swing, indicating heightened allergic responses.¹

In those taking the yeast, **IgE** levels increased only slightly, indicating far less of an allergic reaction. This demonstrated that **yeast fermentate** decreases allergic tendencies by **stabilizing IgE** levels.¹

Scientists also investigated yeast's ability to help prevent **colds** and **flu**.

When given a single **500 mg** dose of dried yeast fermentate, volunteers had significantly *increased* levels of markers of activity of **natural killer cells** within just *two hours*.² These immune cells specifically target and kill cells infected by viruses, such as those that cause colds and flu.

When healthy subjects were given **500 mg** of yeast fermentate daily for eight weeks, they also had a significant increase in **secretory IgA**, an antibody that defends against viruses and bacteria.¹

A Probiotic's Cold and Flu Protection

The probiotic strain ***Lactobacillus rhamnosus* CRL1505** was originally isolated from goat's milk by scientists in northwestern Argentina.¹⁹

Because it was shown to decrease **respiratory infections** in children, the Argentine government has been safely providing *L. rhamnosus* CRL1505 to over **300,000** schoolchildren annually since 2008.^{3,19-21}

Preclinical studies show that this probiotic may help fight the viruses and bacteria that cause the common cold, influenza, bronchitis, and pneumonia.^{20,22}

A team of nutritionists, pediatricians, and immunologists designed a randomized, controlled trial. They enlisted 298 healthy children between ages two and five, a group particularly susceptible to respiratory infections.³

Five days a week, the treatment group was given **100 million CFU** (colony-forming units) of *L. rhamnosus* CRL1505 in a yogurt drink. The placebo group received a yogurt drink without the addition of the beneficial probiotic bacteria *L. rhamnosus* CRL1505.

A common misconception is that all yogurt is a good source of probiotics. In fact, it is only when the exact beneficial bacterial strain is present in the correct amounts that these healthy microorganisms can reliably convey their benefit.

After six months, compared to the placebo group, the children in the probiotic group had experienced:³

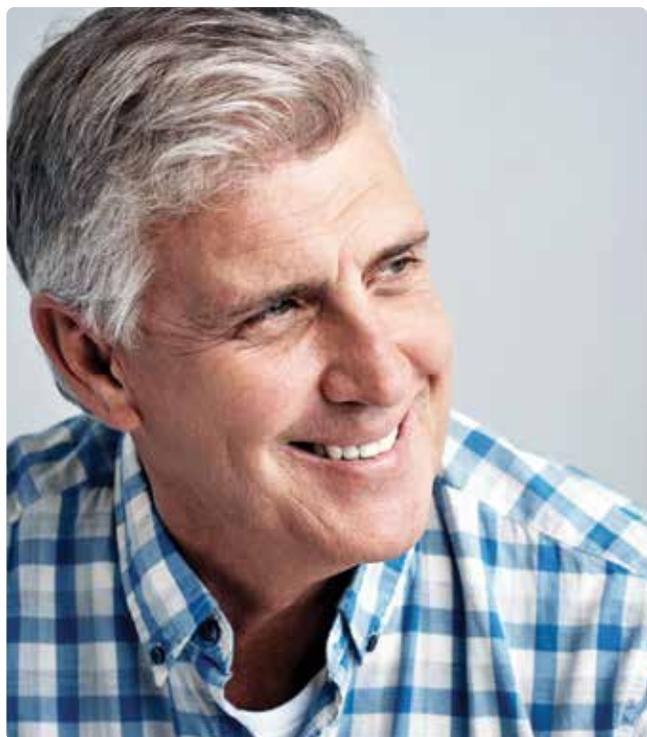
- **49% fewer** infections,
- **55% fewer** cases of cold or flu,
- **46% fewer** cases of fever,
- **47% increase** in levels of secretory IgA, and
- **33% less** antibiotic use.

The treatment group also had **61% fewer** cases of **tonsillitis** and **pharyngitis** (an infection in the back of the throat).³

How the Probiotic Works

Antibodies known as **IgA** constitute an important element of the immune system. Secreted from **mucous membranes** including the nose, mouth, and lungs, IgA can bind to respiratory viruses and block them from invading cells, infecting us, and causing colds, flus, and other respiratory infections.





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The trial that used the *L. rhamnosus* CRL1505 in schoolchildren found that this probiotic significantly *increases* levels of secretory IgA,³ suggesting that this is one way the probiotic enhances immune protection against cold and flu viruses.

Taken together, this probiotic and the dried yeast fermentate can provide optimal protection against colds, flu, and allergies, any time of year.

Summary

Human studies have shown that a **yeast fermentate** safely reduces the occurrence, severity, and duration of allergy, cold, and flu-like symptoms.

The probiotic ***Lactobacillus rhamnosus* CRL1505** also provided protection against colds and flu in a high-risk population, including by supporting secretory IgA levels.

These two ingredients work in multiple ways to boost **immune** defenses against viruses *and* bacteria, enhancing antibodies and natural killer cell activity and providing an anti-allergy effect. ●



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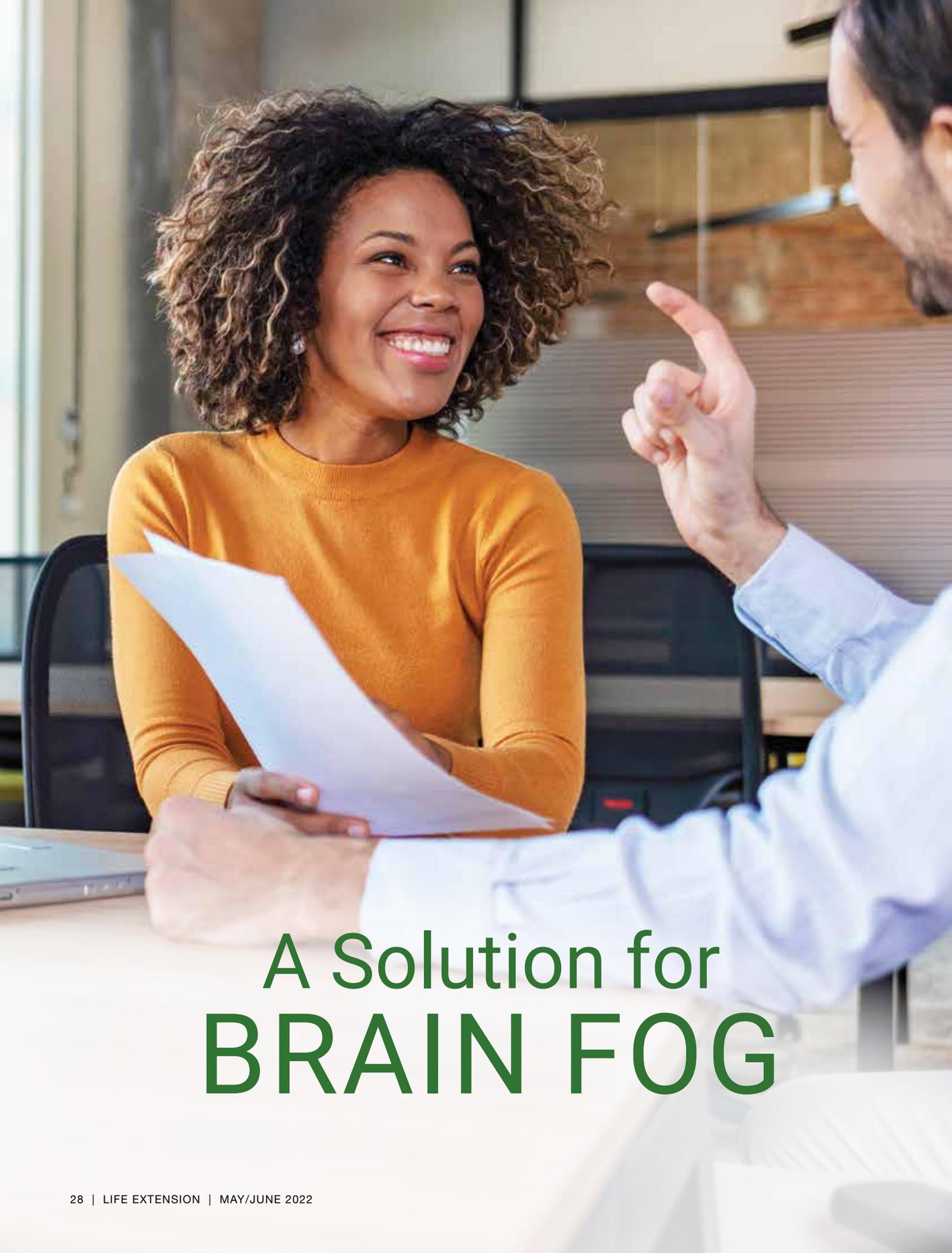
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A Solution for **BRAIN FOG**

BY LISA TANNER



We all have moments when we feel mentally fatigued and find it hard to concentrate. This is often referred to as **brain fog**.

Until recently, it was believed that little could be done about it.

But by studying various medical conditions associated with brain fog, scientists have pinpointed biological alterations in the brain that may cause these feelings of decreased mental energy and sharpness.¹⁻⁷

This research has allowed for the identification of **two** plant-based nutrients that can prevent or potentially even reverse these alterations to bring back mental clarity, energy, and focus.

In clinical studies, **mango leaf extract** containing the compound **mangiferin** improves reaction time, reduces mental fatigue, and boosts attention, performance accuracy, and working memory.^{8,9}

In additional clinical studies, **peppermint oil** significantly *reduces* the development of mental fatigue and *improves* aspects of attention and memory.¹⁰

These two ingredients can help to lift the clouds of brain fog and restore mental energy, clarity, focus, and performance.

What Is Brain Fog?

Brain fog refers to a general feeling of decreased **mental energy** and **focus**. It may be characterized by mental fatigue and clouding, forgetfulness, fuzzy thinking, confusion, and difficulty concentrating.

It's more than an annoyance. It can also decrease **cognitive performance** and hinder the ability to get work done or accomplish goals.

Scientists trying to understand brain fog noted certain medical conditions associated with some of the same mental symptoms.

For example, people with allergies, inflammatory disorders, and dietary sensitivities often complain of brain fog.¹⁻⁷ Over **90%** of patients with **mast cell disorders**, which increase inflammation, report frequent **cognitive impairment** consistent with **brain fog**.²



Even **seasonal allergies** can lead to reduced cognitive performance, including impaired attention, memory problems, and reduced speed of information processing.¹

These observations led scientists to propose that **brain fog** may be caused by several related mechanisms. These include the release of **histamine** (the chemical that causes allergic symptoms), **inflammation**, neurotransmitter **imbalance**, and impairments in neuronal **activity**.¹⁻³

Plant Extracts That Help

When researchers set out to find compounds that could alleviate **brain fog**, they looked for ingredients that met two criteria:

- They had a track record in animal or human studies of improving the **symptoms** of brain fog, like aspects of cognition.
- They targeted the possible **causes** of brain fog, by reducing neuroinflammation, histamine modulation, balancing neurotransmitters, or neuronal activity support.

They found two plant-derived ingredients that were the most promising: **mango leaf extract** and **peppermint oil**.

Mangiferin Boosts Brain Power

Mango leaves, extracts, and teas have long been used in Asian and African countries to treat a range of disorders, including fatigue and exhaustion.

More recently, scientists found that **mango leaf** extracts have **neuroprotective**, anti-inflammatory, and anti-diabetic properties.⁸

Mangiferin is a compound found in mango leaves that is believed to be largely responsible for these effects.

In animal models, mangiferin helps **protect the brain** by reducing oxidative stress and neuroinflammation and by providing neurotransmitter support.¹¹⁻¹³

Animal studies have also found that mangiferin prevents cognitive impairment and memory impairments, symptoms of **brain fog**.¹⁴ In addition, in mice and rat studies, mangiferin was shown to have favorable anti-allergic properties^{15,16} This further suggests benefits against brain fog in those with **allergies**.

More recently, human trials have explored the use of mangiferin-containing extracts in treating symptoms consistent with brain fog.

One study randomized healthy adults into four groups. One group took a mango leaf extract containing **60% mangiferin**, one took **caffeine**, one was given a combination of mangiferin and caffeine, and one received a **placebo**.⁸

The **mango leaf** extract led to a remarkable **47%** improvement in **fatigue** compared to baseline. It also led to an almost **5%** improvement in **reaction time** compared to baseline, which was a significant improvement compared to the placebo group. This was a greater improvement than seen with caffeine alone **or** the combination of caffeine and mangiferin.

Tests of electrical activity in the brain showed that those taking mangiferin had *increased* activity in regions associated with complex cognitive processing, attention, and memory.

In another clinical study, healthy young adults were given either **300 mg** of the mangiferin-containing mango leaf extract or a placebo.⁹ In tests, the extract improved specific areas of cognitive function, including aspects of **attention**, **performance accuracy**, and **working memory**.

These improvements were accompanied by a more **relaxed mood**. This is notable because many people who take caffeine to counter brain fog complain that it *reduces* relaxation and increases nervousness and jitters.

Peppermint Sharpens the Mind

The herb **peppermint** has been traditionally used for its medicinal properties, including as a digestive aid and to promote calming. Its oil contains a high concentration of **monoterpene** compounds, including menthol and menthone.

Studies have shown that plants rich in monoterpenes have cognitive benefits.^{17,18} For example, peppermint teas have been shown to improve **memory** and **mental alertness** in human subjects.¹⁹

Mint species have demonstrated the ability to modulate various **neurotransmitters** in the brain, such as acetylcholine and GABA, which play roles in cognition, mood, and mental alertness.¹⁰

In a clinical trial, researchers randomized healthy adults to receive either **peppermint oil** containing **60% monoterpenes** or a placebo, and tested various aspects of memory, attention, and mood.¹⁰

WHAT
YOU
NEED
TO
KNOW



Banish Brain Fog

- **Brain fog** is a constellation of symptoms that cloud mental function, including reduced mental energy, clarity, focus, and performance.
- Scientists have found clues that inflammation, histamine release, and neurotransmitter imbalances may contribute to brain fog.
- **Mango leaf extract** and **peppermint oil** may help prevent or reverse these potential causes of brain fog.
- Human studies have found that **peppermint oil** and mango leaf extract containing the active compound **mangiferin** each improve aspects of cognition associated with brain fog, including attention, memory, and cognitive performance.
- These two ingredients help combat brain fog and bring back mental focus, attention, energy, and sharpness.



The peppermint oil significantly *reduced* the development of **mental fatigue** and *improved* aspects of **attention** and **working memory**. By contrast, those receiving the **placebo** were severely fatigued within a few hours after the various demanding cognitive tasks.

Peppermint oil and mango leaf extract can help lift brain fog and bring back mental clarity, energy, and focus.

Summary

Brain fog refers to symptoms of reduced mental energy, clarity, focus, and performance.

Research suggests that neuroinflammation, histamine release, and neurotransmitter imbalances can contribute to the development of brain fog symptoms.

Two plant-derived nutrients may help combat brain fog. Preclinical studies show that **mangiferin** from mango leaf extract and **peppermint oil** address the mechanisms thought to contribute to brain fog.

Human studies of mangiferin and peppermint oil show that they improve various aspects of brain fog, reducing **mental fatigue** and improving **attention**, **memory**, and **cognitive performance**.

A combination of these two ingredients may maximize the brain-supporting power of these nutrients and help lift brain fog. •

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- Improved working memory

PEPPERMINT OIL:³

- Reduced mental fatigue
- Improved attention and memory

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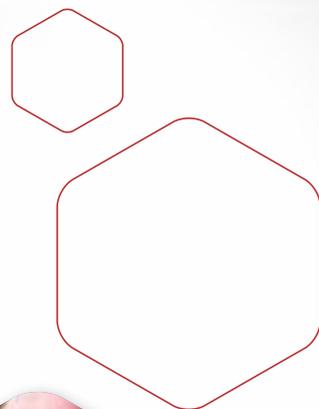
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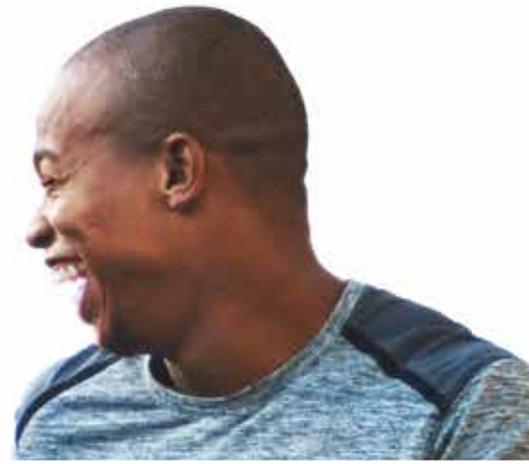
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Patented Blend Targets **BODY WEIGHT** and **WAISTLINE**



BY MICHAEL DOWNEY

Aging adults tend to gain about one or two **pounds** every year.¹

And losing weight is never easy.

Scientists have identified two **plant extracts** that target **fat accumulation** and **fat metabolism**.

Clinical studies have shown that a *patented blend* of these herbal extracts, when combined with a healthy diet and a 30-minute walk, five days per week, can:^{2,3}

- Reduce waist circumference by an average of **4.7 inches**, and
- Decrease hip size by an average of **4.1 inches**.

Doctors frequently recommend that overweight people reduce their weight by **5%** a year to achieve wide-ranging health benefits.

In *just 16 weeks*, this patented **plant extract** blend reduced body weight by an average of **6.7%** when combined with a healthy diet and a 30-minute walk, five days per week.³

For many people, a boost like this is needed to jump-start their resolve to lose **weight** and cut **inches** from their waist and hips.

Fat-Fighting Herbal Extracts

About **three quarters** of the American population are **overweight** or **obese**.⁴

The excess weight people carry around their **waist** is generally the most difficult to lose—and the most dangerous.⁵

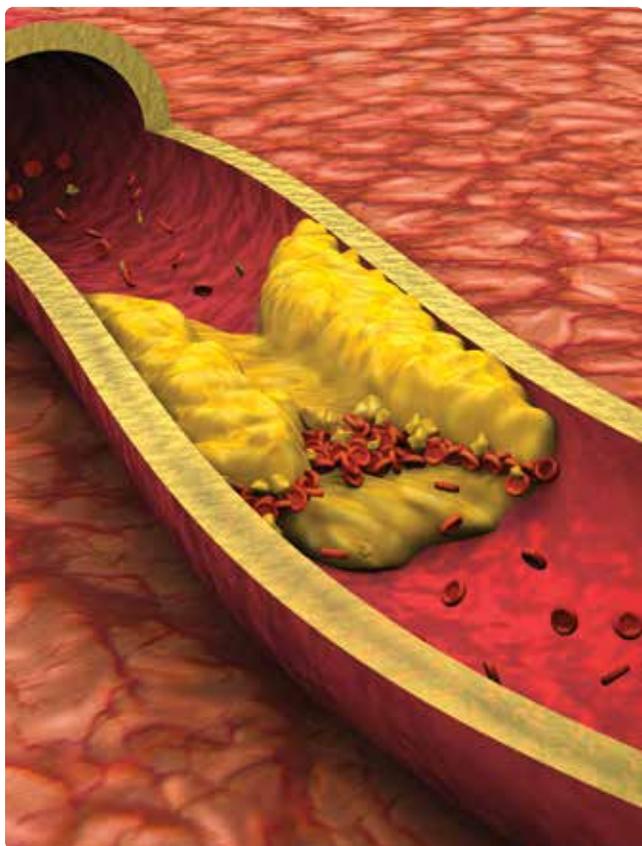
Seeking a solution, scientists screened a variety of **botanicals** to assess their ability to *promote* fat loss and *prevent* fat accumulation.⁶

They identified two plants used in traditional Indian medicine:^{3,6}

- ***Sphaeranthus indicus*** (*S. indicus*) flower, and
- ***Garcinia mangostana*** (mangosteen) fruit rind.

S. indicus is a flowering plant which has long been used in Ayurveda medicine as a nerve tonic and to treat disorders ranging from diabetes and indigestion to fever and cough.⁷

Mangosteen is a tropical fruit that has been used in traditional medicines to treat inflammation, wounds, abdominal pain, urinary tract problems, and chronic ulcers.⁸⁻¹⁰



In a series of clinical studies, researchers tested the impact of a patented blend of ***S. indicus*** flower extract plus **mangosteen** fruit rind extract on **weight loss**.

Help for Overweight People

Scientists conducted a placebo-controlled, randomized **human** trial in men and women who were **overweight** (with an average BMI of **28.3 kg/m²**).³

Over the 16-week study, subjects consumed a balanced diet of approximately **2,000 calories** a day. They were also instructed to walk for **30 minutes** per day, five days a week.³

Half of the subjects received **400 mg** of the ***S. indicus-mangosteen*** blend before breakfast and dinner. The others received placebos.

After 4, 12, and 16 weeks, the ***S. indicus-mangosteen*** supplemented group showed significantly **greater weight loss** compared to the placebo group.³

At **16 weeks**, the average results for the group taking the **herbal extracts** were striking:³

- **Weight** was reduced by **11.2 pounds (6.7%)**, compared to 2.4 pounds (**1.4%**) for those taking placebos,
- **BMI** (Body Mass Index) was reduced by **1.9 kg/m²** compared to **0.4 kg/m²** in the placebo group,
- **Waist** circumference was reduced by **3.9 inches**, compared to **1.5 inches** in the placebo group, and
- **Hip** circumference was reduced by **4.1 inches**, compared to **2 inches** for those taking placebos.

Reduction in Obesity

Another team of scientists studied the effects of this same patented herbal blend on people who were **obese**, with a **BMI** of **30** or higher.²

Over eight weeks, participants consumed a prepared diet of roughly **2,000 calories** a day and walked for **30 minutes** per day, five days a week.

Half of the subjects received placebo capsules, while the others received **400 mg** of the ***S. indicus-mangosteen*** blend **twice** daily, before breakfast and dinner.²

WHAT
YOU
NEED
TO
KNOW



Help Losing Weight and Fat

- Many people struggle to lose weight, and even those who do find it difficult to reduce the size of their **waistline**.
- A patented blend of ***Sphaeranthus indicus*** flower and **mangosteen** fruit rind extracts produces meaningful weight loss and significantly reduced the size of waist and hips, when combined with a balanced diet and exercise.
- In a controlled clinical trial of overweight individuals, this patented blend of ***S. indicus-mangosteen*** extracts decreased weight by an average of **11.2 pounds**, reduced waist size almost **four inches** on average and decreased hip size and body mass index in just **16 weeks**.
- The patented blend of ***S. indicus-mangosteen*** extracts also reduced **triglycerides, LDL** ("bad") cholesterol, and total **cholesterol** levels, which helps improve cardiovascular health.

Improved diet and exercise helped both groups lose weight.

The ***S. indicus-mangosteen*** supplemented group had **significantly greater weight loss** and dropped approximately **twice** as many **inches** from their waistline and hips than the **placebo** group.

After just **8 weeks**, these **obese** individuals taking the two **herbal extracts** on average had their:²

- **Weight** reduced by **11.5 pounds**, compared to **3.3 pounds** for the placebo group,
- **BMI** reduced by **2.2 kg/m²**, compared to just **0.6 kg/m²** for those taking placebos,
- **Waist** circumference reduced by **4.7 inches**, compared to **2.4 inches** in the placebo group, and
- **Hip** size reduced by **2.5 inches**, compared to **1.2 inches** for subjects receiving placebos.

There were no safety issues in either of the studies, and no adverse effects were reported.^{2,3}

How the Herbal Extracts Work

In vitro (laboratory) studies have been conducted showing the **S. indicus-mangosteen** extract blend inhibits creation of new **fat cells** while promoting the breakdown of *existing* fat cells.^{3,6}

These cell-based studies showed that the patented blend of **S. indicus-mangosteen** extracts may:

- Reduce levels of **ADRP** (*adipocyte differentiation-related protein*), a factor that stimulates the accumulation of fat. Lowering ADRP levels inhibits fat storage.⁶
- Reduce levels of **fatty acid synthase**, an *enzyme* that catalyzes the synthesis of fatty acid. Lowering this enzyme inhibits the creation of new fat.³
- Inhibit expression of **perilipin**, a protein that coats fat droplets and keeps them from being broken down. Reducing perilipin allows fat to be broken down more easily.⁶
- Decrease expression of **PPAR-gamma**, a metabolic “sensor” that triggers fat storage and production of new adipose cells. Lowering PPAR-gamma expression helps prevent fat from accumulating.⁶

Together, these actions help reduce fat accumulation and spur fat breakdown, potentially explaining the **weight** and **waistline** reductions seen in human trials.

Improved Cardiovascular Markers

The benefits of this patented blend of **S. indicus-mangosteen** extracts go further.

In the study of **overweight** individuals, researchers noted an improvement in **lipid** measurements, critical markers of cardiovascular health.³

Levels of dangerous **triglycerides** and **VLDL** (very low-density lipoprotein cholesterol) that were **elevated** at the start of the study dropped almost to the **normal** range. Overall cholesterol and LDL were also reduced.³

In just **16 weeks**, and compared to placebo, subjects taking the dual-patented blend on average had their:³

- **Triglycerides** decreased by **22%**,
- **Cholesterol** decreased by **12%**,
- **LDL** (“bad”) cholesterol decreased by **16%**,
- **VLDL** cholesterol decreased by **19%**,
- **HDL** (“good”) cholesterol increased by **6%**, and
- **LDL/HDL** ratio decreased by **18%**.





Together with the reduction in **body weight**, these changes in blood **lipids** can provide additional protection against an array of cardiovascular disorders and other vascular disorders.³

Summary

Being **overweight** or **obese** poses serious health risks. Excess weight around the **waist** is especially dangerous.

Scientists have identified two **plant extracts** that, when combined in a specific ratio, decrease weight by an average **6.7%** within **16 weeks**, when combined with a balanced diet and regular exercise.

In controlled clinical trials, this patented blend of **S. indicus** flower and **mangosteen** fruit rind not only produced meaningful **weight loss**, but also substantially decreased the size of **waist** and **hips**.

In an additional benefit, artery-clogging blood **lipid** levels improved significantly, providing extra benefits for heart health. •



Benefits of Reducing Weight by Just 5%

Setting unrealistically high goals can doom any weight-loss program.

Experts agree that losing just a **few pounds** can make a huge difference, and many point to the substantial benefits of a reasonable and *achievable* **5%** reduction in weight.

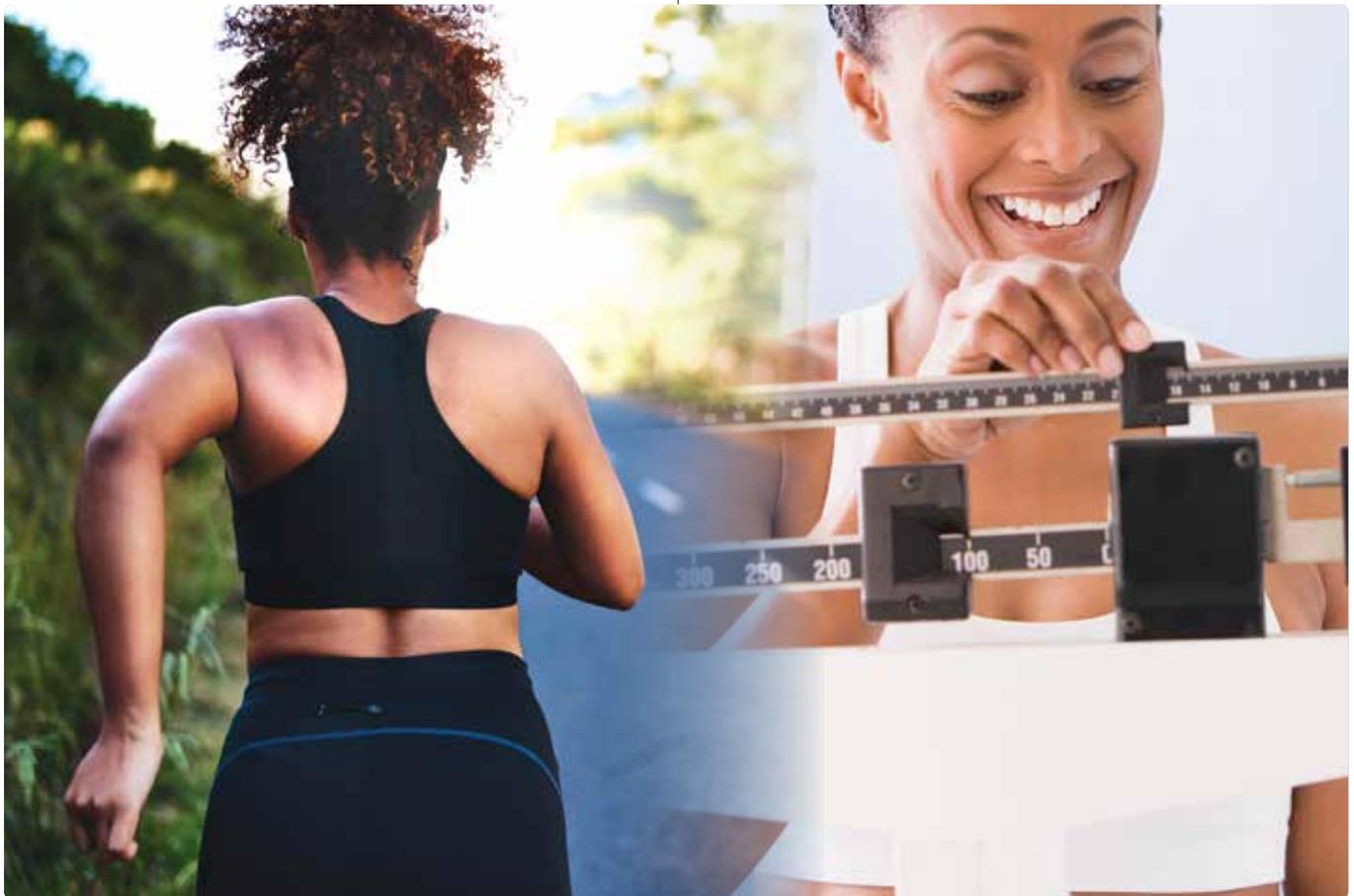
Evidence shows that decreasing your weight by only **5%** may:^{11,12}

- Protect knee **joints** and reduce the risk of **osteoarthritis** of the knee,
- Help prevent or delay **type II diabetes**,
- Help diabetics control **blood sugar** and inhibit diabetes-related conditions,
- Increase levels of protective **HDL** cholesterol, lowering the risk of heart disease,
- Decrease levels of **triglycerides**, reducing the risk of heart attack or stroke,
- Lower systolic **blood pressure** by about **five points**,
- Improve **sleep** and reduce **sleep apnea**, and
- Help reverse **insulin resistance**.

In controlled clinical studies, people who took a patented blend of **S. indicus** and **mangosteen** extracts lost an average of between **6.4%** and **6.7%** of their body weight, when combined with a balanced diet and exercise.^{2,3,6}

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3 mg
100 vegetarian capsules

References

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Zinc promotes critical **immune** functions and healthy **bones**.

This formula provides **50 mg** of zinc in a convenient, vegetarian capsule.

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TARGETED SLIMMING FOR WAIST AND HIPS

In a clinical trial, a proprietary blend of **Sphaeranthus indicus** flower and **mangosteen** extracts combined with a standard diet and regular exercise for 8 weeks enabled average reductions in:*

- Body **weight** by **11.5 pounds**
- **Waist** size by **4.7 inches**
- **Hip** size by **2.5 inches**

Waistline Control™ contains this patented blend of extracts.

The dose used in **human** studies is one capsule, twice daily before meals.

* *J Med Food*. 2013 Jun;16(6):529-37.

This supplement should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.



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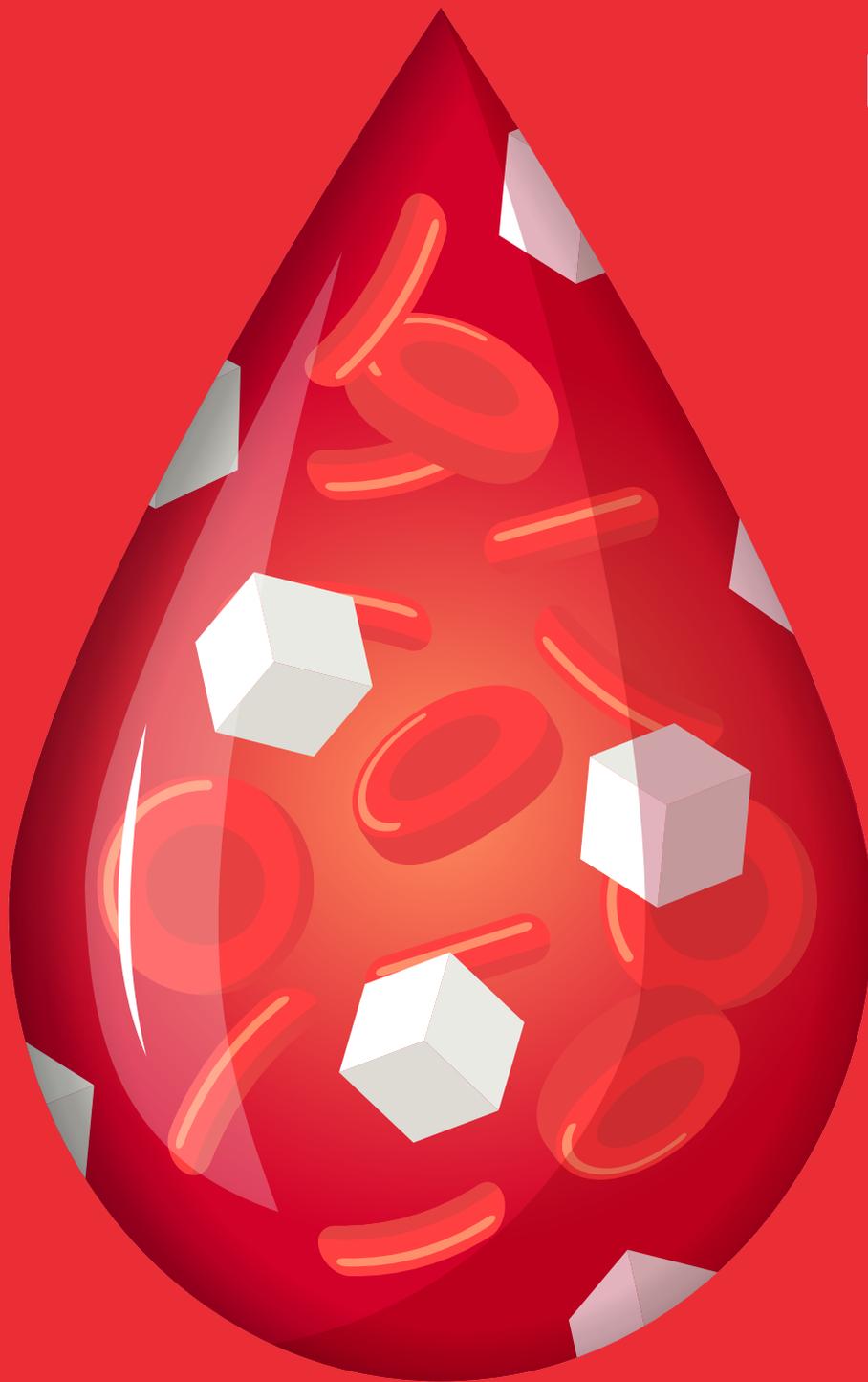
60 vegetarian capsules

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Restore Healthier GLUCOSE LEVELS



BY MICHAEL DOWNEY

With age, a sedentary lifestyle, or a diet high in saturated fat or refined carbohydrates and simple sugars, our cells become **insulin resistant**.

This causes **blood glucose** levels to *remain high*.

Chronically elevated **fasting blood glucose** is a serious danger.

It can lead to long-term consequences such as heart disease and stroke, dementia, cancer, accelerated aging, and premature death.¹⁻⁸

Life Extension believes everyone should strive for optimal glucose control, regardless of whether or not they are diabetic.

This means taking action to improve your glycemic control if your fasting glucose is over **85 mg/dL** or your **HbA1C** is higher than **5.0%**.

Doctors generally prescribe glucose-lowering drugs *only* to people who have been diagnosed as diabetic. That leaves **millions** of Americans at risk.

Scientists have found several nutrients that can safely promote healthy **blood sugar** levels and **insulin sensitivity**.



The Risks of Elevated Glucose

Insulin resistance occurs when the body's cells no longer respond efficiently to the hormone insulin. As a result, cells cannot easily take up **glucose** from the blood and blood **sugar** levels rise.

Insulin resistance becomes more common as we age. It usually develops without symptoms, allowing blood **glucose** levels to creep to dangerously **high** levels over time.

Insulin resistance is considered a causative factor of **metabolic syndrome**. This condition is defined as the presence of at least three of the following:⁹

- High fasting blood sugar,
- Abdominal obesity,
- High blood pressure,
- Low HDL ("good") cholesterol, and
- High triglycerides.

Epidemic Health Crisis

The results from a nutritional survey in the United States found that, by 2016, over **half** of adults age 60 and over had **metabolic syndrome**.¹⁰ These people have a *higher* risk of cardiovascular disease, type II diabetes, non-alcoholic fatty liver disease and liver cancer, chronic kidney disease, gout, sleep apnea, cataracts, retinopathy, and other eye pathologies, and **premature death**.¹¹⁻¹³

Many people with **metabolic syndrome** have elevated blood sugar levels but their glucose numbers are below the threshold for a diagnosis of **diabetes**.

Silent Diabetes

Prediabetes is the term to describe higher than normal blood sugar that is lower than the diabetic threshold.¹⁴ It has been estimated that more than **470 million** people worldwide will be prediabetic by 2030.^{14,15}

Up to **70%** of people with prediabetes will eventually develop diabetes, according to an expert panel of the American Diabetes Association.^{14,15}

Diet and other lifestyle interventions can help reduce the risk of progressing to diabetes.¹⁶ But in *anyone* with high blood sugar, **lasting damage** can occur on a daily basis.

To meet this challenge, scientists identified several nutrients that work in different ways to **lower blood glucose** levels:

- Cinnamon,
- Chromium,
- Amla,
- Shilajit, and
- Iodine-rich seaweed.

Cinnamon Reduces Glucose

Cinnamon has been used to help manage conditions including obesity, metabolic syndrome, and diabetes.

Scientists identified a purified, water-soluble, **cinnamon extract** that demonstrates **glucose-lowering** properties.¹⁷⁻¹⁹

In **human trials**, oral supplementation with a water-soluble cinnamon extract was shown to:²⁰⁻²³

- Lower fasting blood **glucose**,
- Enhance insulin sensitivity,
- Decrease systolic blood pressure,
- Reduce total and **LDL** ("bad") cholesterol, and
- Improve lean mass body composition.



WHAT
YOU
NEED
TO
KNOW



Natural Ways to Control Glucose

- With age, **insulin resistance** and elevated **glucose** levels become more common. These conditions often lead to metabolic syndrome and prediabetes, increasing risk for heart disease, dementia, stroke, and premature death.
- **Cinnamon** increases the body's ability to take up glucose from the blood and transport it to cells, *reducing* blood glucose and increasing insulin sensitivity.
- **Chromium, amla, and shilajit** all support healthy cellular glucose metabolism.
- Iodine-rich **brown seaweed** blocks the conversion of starches into glucose and increases insulin sensitivity, thereby promoting glucose uptake by cells, further reducing blood glucose levels.
- Together, these nutrients can help maintain healthy glucose levels and prevent the damage elevated levels can do.

Cinnamon has been shown to impact these metabolic parameters in more than one way.

In one preclinical model, a water-soluble cinnamon extract increased production of **glucose transport molecules** known as **GLUT4**, which enable cells to take up glucose from blood plasma in the presence of insulin.²⁴

Without effective GLUT4 transporters, blood glucose can steadily rise, eventually damaging tissues through a process known as **glycation**, and also by inducing insulin resistance.^{25,26}

Preclinical data indicate that cinnamon activates and also increases the production of **metabolic sensors** called **PPARs**,²⁷ mirroring a key mechanism of some antidiabetic drugs.²⁸ Increased expression of PPARs helps *promote insulin sensitivity*, thereby improving glucose uptake.²⁹

Chromium Fights High Glucose

More than 60 years ago, scientists established that having **low** levels of the mineral **chromium** contributes to high blood sugar.³⁰

Studies show that chromium deficiency is associated with **insulin resistance** and **diabetes**.^{31,32}

One study found that chromium deficiency is common in people with **prediabetes**.^{33,34}

In **type II diabetics**, chromium supplementation has been found to significantly:³¹

- Improve blood sugar levels,
- Lower HbA1c,
- Raise HDL cholesterol, and
- Lower triglycerides.

Chromium is believed to work by improving **intracellular signaling systems** that are critical to cells' ability to detect and respond to elevated glucose levels in the blood. It does this by activating glucose-transporting **GLUT4** molecules.³⁵



Amla and Shilajit Optimize Chromium Benefits

Two organic compounds have been identified that deliver **free-radical scavenging** activity and provide **glucose-lowering** effects: **amla** and **shilajit**.

Amla is an herb also known as Indian gooseberry. It has been shown to **lower blood glucose** in diabetic animals and humans.^{36,37}

Shilajit is a Himalayan nutrient that has been used for centuries. It is rich in **fulvic acid**, an organic compound that is thought to account for the many medicinal and biological properties of shilajit. It has been used in the management of diabetes and many gastrointestinal conditions like diarrhea, gastritis, ulcers, and more.³⁸⁻⁴⁰

Combining **chromium** with **amla** and **shilajit** promotes removal of glucose from the bloodstream and efficient use of glucose within cells.

In a study of type II diabetics, supplementation with a **chromium, amla, and shilajit complex**, in addition to current medication, compared to placebo, resulted in:⁴¹

- Better after-meal glucose control,
- Decreases in C-reactive protein (marker of inflammation), and
- Reductions in LDL levels.

Brown Seaweed Stops Conversion of Carbs to Sugars

Another way to improve **glucose control** is to limit the amount of glucose the body has to process in the first place.

Brown seaweed blunts the conversion of starches into glucose in the gastrointestinal tract by blocking two enzymes needed for this conversion, **alpha-amylase** and **alpha-glucosidase**.^{42,43} As a result, less glucose is absorbed into the bloodstream.

Brown seaweed is also rich in **iodine**, and animal studies show that oral iodine reduces glucose.^{44,45}

In clinical trials, **brown seaweed** extracts:⁴⁶⁻⁴⁸

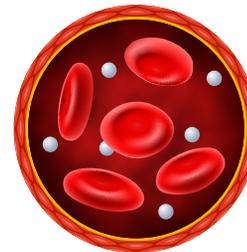
- Lowered **fasting glucose** levels,
- *Reduced* insulin levels and *increased* insulin sensitivity (when taken before eating carbohydrate-rich bread),
- Lowered A1c readings, and
- Improved after-meal **cognitive function**.



GLUCOSE LEVELS



HYPERGLYCEMIA



NORMAL



HYPOGLYCEMIA

Seaweed, cinnamon, chromium, amla, and shilajit all help support healthy glucose levels, warding off the damage elevated blood sugar can do.

Summary

Aging is associated with increased **insulin resistance** and elevated **glucose** levels and with greater risk of diabetes, heart disease, stroke, cancer, and premature death.

The nutrients **cinnamon**, **chromium**, **amla**, **shilajit**, and **seaweed** help the body transport and burn glucose, block the conversion of carbohydrates into glucose, and work in other ways to **reduce blood glucose** levels and optimize energy production.

These innovative compounds can help people maintain healthy blood glucose levels well into older age. •

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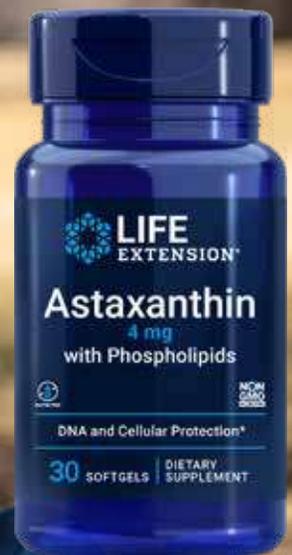
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Life Extension® combines **4 mg** of **astaxanthin** with a blend of four different **phospholipids**, which has been shown to enhance carotenoid **absorption** by **several-fold**.⁴

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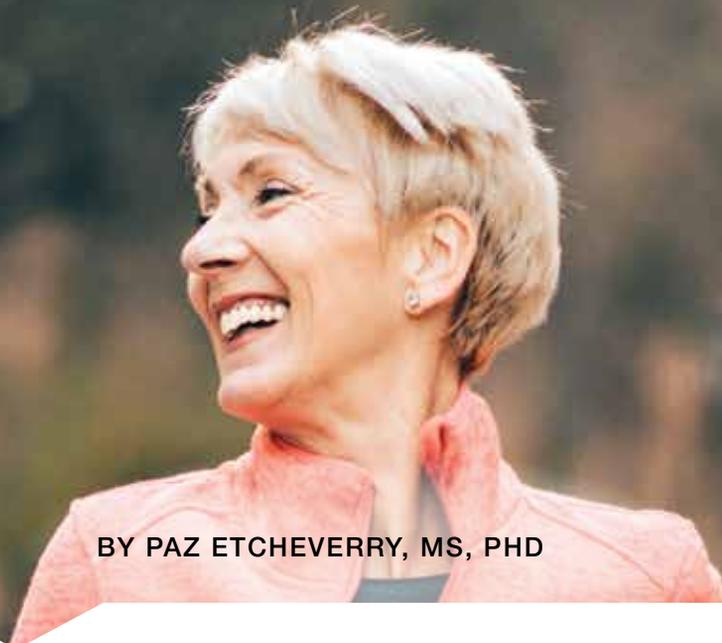


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Overlooked Dangers of ELEVATED HOMOCYSTEINE





BY PAZ ETCHEVERRY, MS, PHD

Doctors often overlook an amino acid in the blood called **homocysteine** that can increase risk of:

- Cerebral vascular disorders,
- Dementia,
- Arterial calcification, and
- Hearing loss.

There are many ways that elevated **homocysteine** can harm health.

Since 1981, **Life Extension** has advised annual monitoring of homocysteine status with a simple blood test.

A young, healthy body can reduce homocysteine by converting it to non-toxic compounds.

Older individuals often need **B vitamins** to reduce homocysteine to youthful ranges.

What is Homocysteine?

Homocysteine is an amino acid produced in the body during the metabolism of a common dietary amino acid called **methionine**.^{1,2}

Vitamins B6, B12, riboflavin (vitamin B2), and **folate** help break down homocysteine into other, beneficial amino acids.²⁻⁵

Deficiencies in these vitamins may lead to elevated homocysteine levels, a condition known as **hyperhomocysteinemia**.⁶

Elevated homocysteine may also arise from genetic defects or mutations in **enzymes** involved in the metabolism of methionine.^{1,7}

The Risks of High Homocysteine Levels

Elevated homocysteine has been associated with the development of **atherosclerosis, stroke, cognitive disorders**,² and **hearing loss**.⁸

The normal homocysteine blood range for commercial laboratories is between **5 and 15 micromoles per liter (μmol/L)**.

Life Extension believes that homocysteine levels **below 12 μmol/L** are good and that the ideal blood levels should be below **8 μmol/L**, much lower than the currently accepted **<15 μmol/L**.



Homocysteine Harms Arterial Health

The potential role of elevated homocysteine as a risk factor for **vascular calcification progression** was suggested in a study published in **2020** in the **Journal of the American Heart Association**.⁹

Calcification of arteries and heart valves is considered irreversible, though **Life Extension** is researching methods to reverse calcified tissues.

Elevated homocysteine is an independent risk factor for **atherosclerosis**.¹⁰

In a study in Africa, patients who had suffered a **stroke** were found to have, on average, significantly **higher** homocysteine levels than healthy subjects. They also had **lower** average **vitamin B12** levels.¹¹

A 2020 review of human studies involving more than **11,000** participants determined that **high homocysteine levels** were associated with increased risk of **stroke**. For every **1 μmol/L** increase in homocysteine, the relative **risk for stroke** increased by **6%**.¹²

Researchers believe homocysteine may cause arterial damage and reduce the flexibility of blood vessels. It may also contribute to **oxidative stress** and **inflammation** in blood vessels and reduced production of **nitric oxide**, a key compound for endothelial health.¹

Homocysteine may also increase dangerous **clotting** in the blood,¹ reduce the synthesis of **HDL** (“good”) cholesterol,¹³ and promote the oxidation of **LDL** (“bad”) cholesterol, which contributes to **atherosclerosis**.¹⁰

Brain Aging

Evidence shows that elevated homocysteine plays a role in **brain aging**.

MRI scans of 36 healthy volunteers between ages 59 and 85 revealed that those with **higher** homocysteine levels had greater **loss** of **white matter**. This **brain** tissue is composed of fibers that conduct nerve signals.^{14,15}

Some evidence suggests that elevated homocysteine may increase the risk of **Alzheimer’s disease**.¹⁶

For example, individuals with elevated homocysteine levels are more likely to have markers of **Alzheimer’s disease** progression in brain tissue, including neurofibrillary tangles, dysfunctional protein accumulation, and brain shrinkage.¹⁷

One meta-analysis found that every **5 μmol/L increase** in homocysteine levels is associated with a **15%** increase in Alzheimer’s disease risk.¹⁸

WHAT
YOU
NEED
TO
KNOW



In patients with Parkinson's disease, elevated homocysteine has been associated with worse cognitive function.¹⁹

Even *modest* elevation of homocysteine within the normal range ($>11 \mu\text{mol/L}$) has been associated with a substantial increase in risk of dementia in the elderly.¹⁷

Hearing Loss

A range of studies over the past 20 years have shown that high homocysteine levels are associated with **hearing loss**.

One **2019** study found that among 52 patients experiencing sudden **hearing loss**, **63%** had *higher* than normal homocysteine levels.²⁰

Another study the same year noted that participants with **sudden deafness** had *higher homocysteine* levels and *lower folate* levels than those with normal hearing.²¹

Australian researchers reported that of 2,565 study participants, those with high homocysteine levels had a **64%** increased likelihood of **hearing loss**. Low folate levels also increased the odds of mild hearing loss.²²

Keeping Homocysteine at Safe Levels

- **Homocysteine** is a non-essential amino acid produced in the body.
- High homocysteine levels can be **toxic**, increasing risk for cerebrovascular disease, brain disorders, and hearing loss.
- A simple blood test can determine homocysteine status. Levels above **15 $\mu\text{mol/L}$** are considered high, and **Life Extension** recommends maintaining levels below **12 $\mu\text{mol/L}$** , with levels less than **8 $\mu\text{mol/L}$** being optimal.
- The body relies on **B vitamins** to lower homocysteine levels. Oral intake of **vitamin B6**, **vitamin B12**, **folate**, and **riboflavin** can safely reduce homocysteine concentrations in the body.

Strategies to Lower Homocysteine

Several **B vitamins** can help safely reduce homocysteine levels.^{23,24}

Vitamin B6 aids the body in metabolizing homocysteine because a B6-dependent enzyme converts homocysteine into **cysteine**, a beneficial amino acid.²⁵

In vitamin B6-deficient patients with asthma, taking vitamin B6 daily for six weeks considerably reduced homocysteine levels.²⁵

Vitamin B12 and **folate** are vital for the conversion of homocysteine into **methionine**, reducing homocysteine levels in the body.

In a study of post-menopausal women, those taking **5 mg** per day of **folic acid** for six weeks had lower homocysteine levels than those taking a placebo.²⁶

According to a systematic review, **folic acid** intake in people with **type II diabetes** decreases homocysteine levels and may improve glucose levels, compared to placebo.²⁷

Riboflavin (or vitamin B2) is particularly useful for people who have a mutation in the **MTHFR enzyme**. Mutations in this enzyme lead to high homocysteine levels.

In one study, taking **riboflavin** daily for 12 weeks decreased homocysteine levels in subjects with a mutation in MTHFR by **22%**.²⁸

In another study of subjects over age 60 with low riboflavin levels, taking riboflavin daily for just four weeks lowered homocysteine concentration by **1.31 µmol/L**.²⁹

One of the nutrients most associated with reducing high levels of homocysteine is folate, which works to methylate and thus detoxify homocysteine.^{30,31}

A separate but related role for methylation and folate is in DNA methylation, an epigenetic way that the body regulates gene expression.³²

Therefore, adequate folate is needed to prevent accumulation of excessive toxic homocysteine, but also to support healthy DNA methylation.

The most efficient way to supplement folate is to take it in the form the body actually uses—the activated form, variously referred to as **5-methyltetrahydrofolate**, **5-MTHF**, or **L-methylfolate**.³³

The **5-MTHF** form of folate is readily available to cells, to promote detoxification of homocysteine and support healthy DNA methylation.

Testing and Dosages

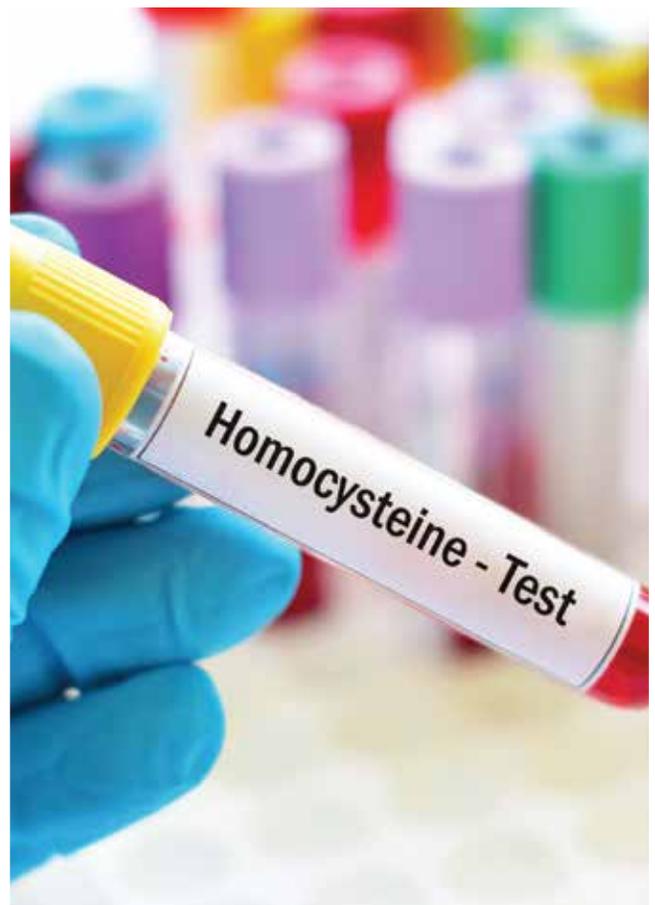
A simple **blood test** can determine homocysteine status. We recommend it be repeated annually as part of your standard yearly testing.

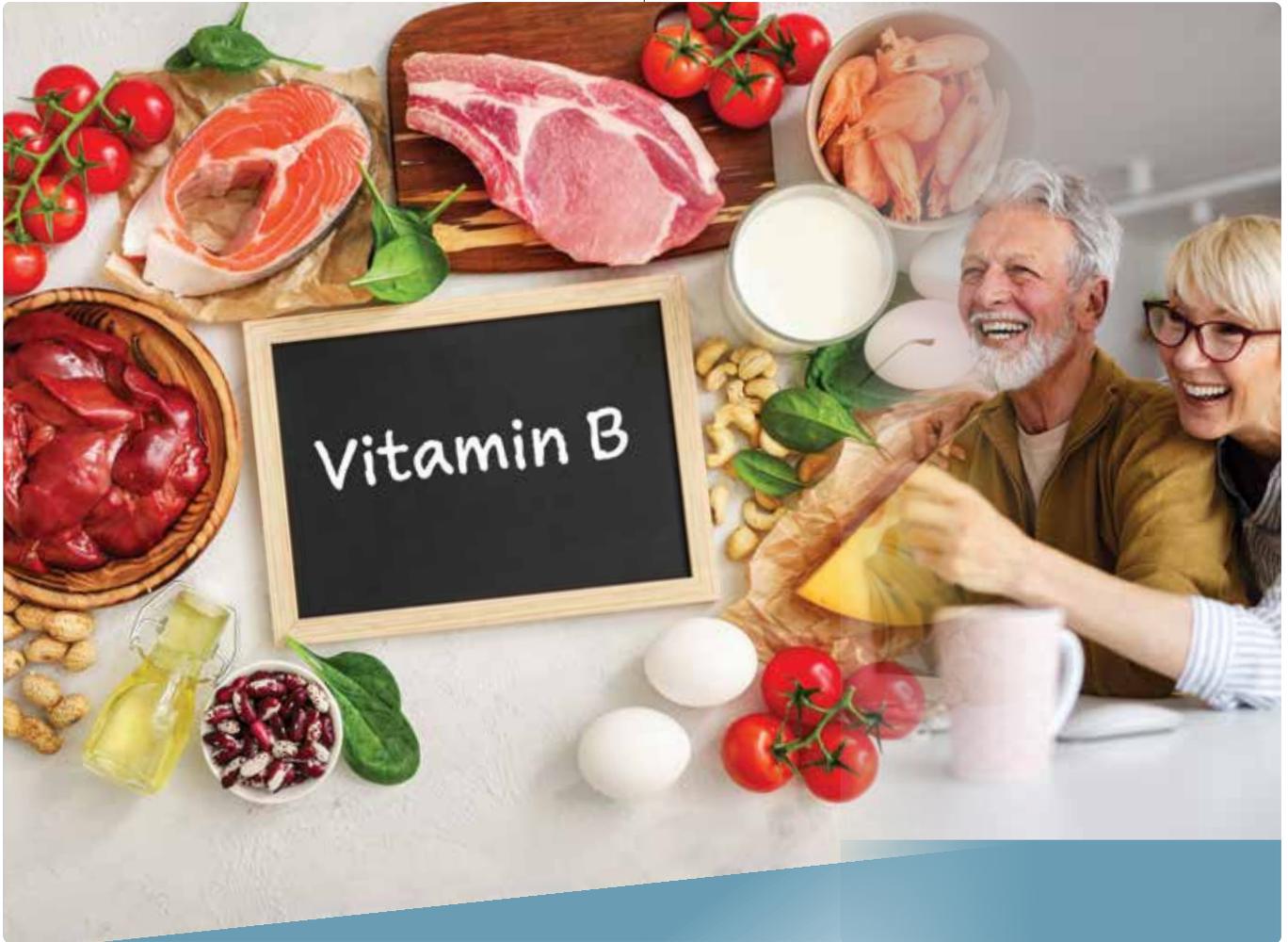
Though levels above **15 µmol/L** are considered high, **Life Extension** recommends maintaining levels below **12 µmol/L** and considers under **8 µmol/L** to be optimal.

Those trying to lower homocysteine should take B vitamins daily. Here are daily B vitamin suggestions:

- **Vitamin B6** as pyridoxal 5'phosphate, **100 mg to 200 mg**
- **Vitamin B12** as methylcobalamin, **300 mcg to 1,000 mcg**
- **Folate** as 5-methyltetrahydrofolate (5-MTHF), **1,000 mcg to 10,000 mcg**
- **Vitamin B2** as riboflavin, **25 mg to 100 mg**

Getting tested again three months after starting these nutrients can ensure they are working properly to achieve optimal homocysteine levels.





Summary

Elevated levels of the amino acid **homocysteine** (above **15 $\mu\text{mol/L}$**) can contribute to increased risk for conditions that damage the blood vessels, brain, and hearing.

The body relies on adequate levels of B vitamins to break down homocysteine. Taking **vitamin B6**, **vitamin B12**, **folate**, and **riboflavin** is a safe and effective way to reduce high homocysteine concentrations. ●

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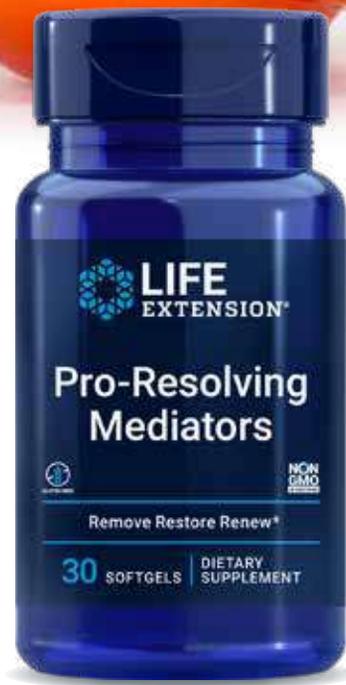
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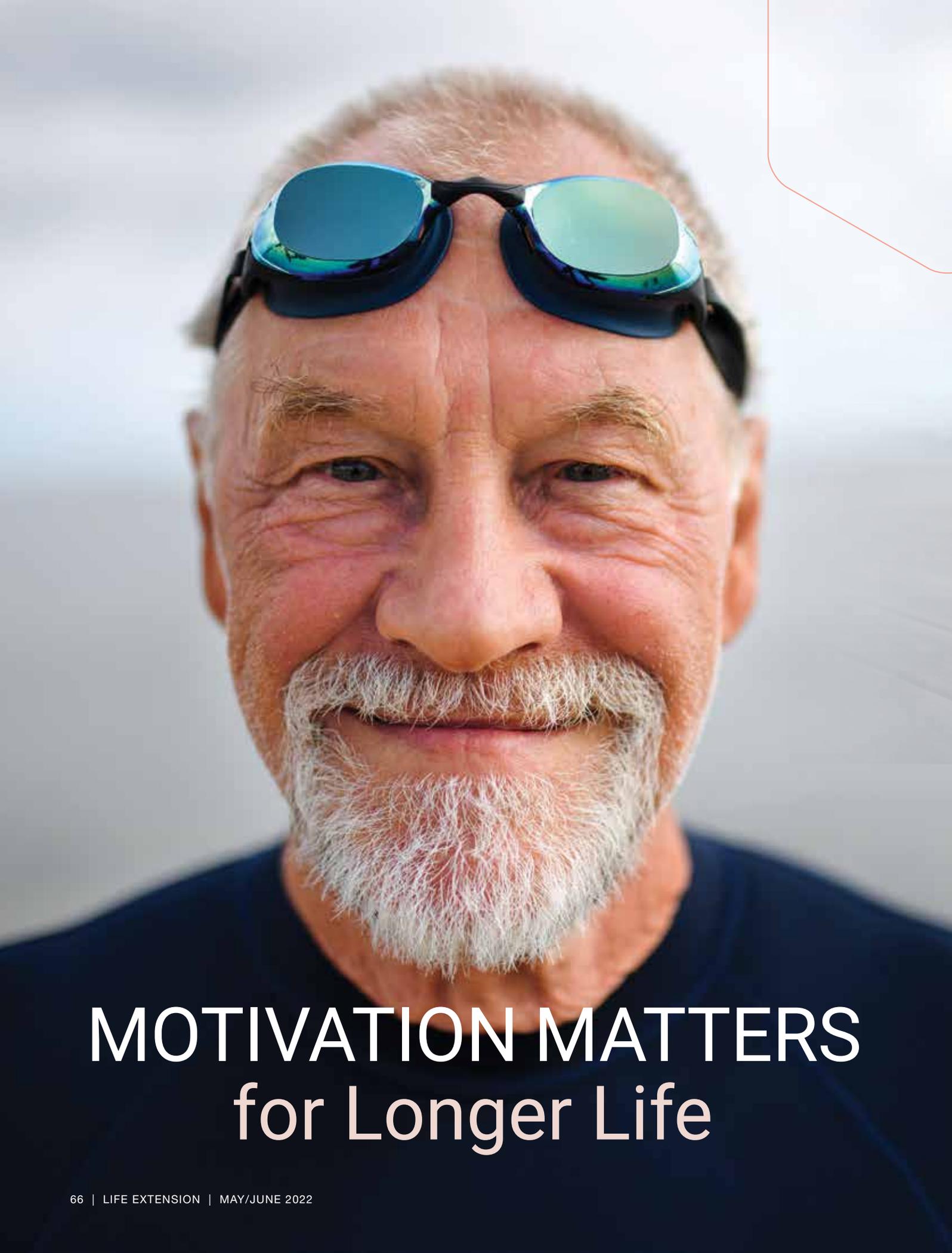
5-MTHF (activated folate)	8,500 mcg ^o
Methylcobalamin (activated vitamin B12)	1,000 mcg
Pyridoxal 5'-phosphate (activated vitamin B6)	100 mg
Riboflavin (vitamin B2)	25 mg

^oDFE (Dietary Folate Equivalents)

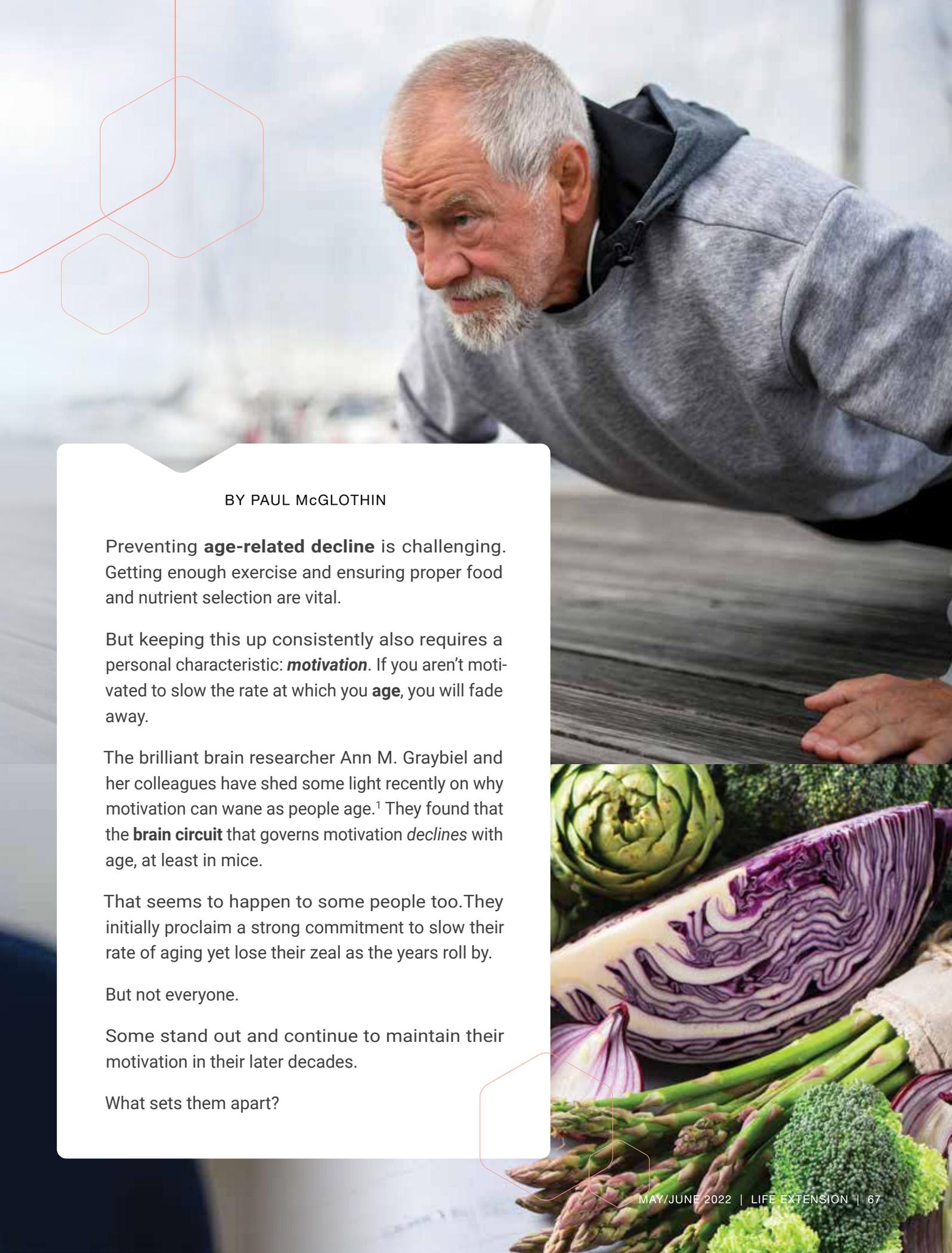


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MOTIVATION MATTERS for Longer Life



BY PAUL McGLOTHIN

Preventing **age-related decline** is challenging. Getting enough exercise and ensuring proper food and nutrient selection are vital.

But keeping this up consistently also requires a personal characteristic: **motivation**. If you aren't motivated to slow the rate at which you **age**, you will fade away.

The brilliant brain researcher Ann M. Graybiel and her colleagues have shed some light recently on why motivation can wane as people age.¹ They found that the **brain circuit** that governs motivation *declines* with age, at least in mice.

That seems to happen to some people too. They initially proclaim a strong commitment to slow their rate of aging yet lose their zeal as the years roll by.

But not everyone.

Some stand out and continue to maintain their motivation in their later decades.

What sets them apart?

Lifelong Motivation

To answer this question about motivation, my partner, Meredith Averill, and I looked for **centenarian role models** who were motivated to embrace the aging challenges they faced—and to *overcome* them.

One of them is Ralph Cornell.

Back in 2008, Meredith and I published *The CR Way*, our guide to how **calorie restriction** can improve health and extend lifespan.

We were lucky to have had Ralph as a mentor.

Ralph was a happy centenarian from the heartland town of Massillon, Ohio, who lived to 104.

Staying Positive

One of the keys to staying motivated is finding **joy** in life.

He was unfailingly **optimistic**. Even during his last months, he was motivated to plan diet and lifestyle changes with the hope of living to 112, the age of Ohio's oldest person at the time. Ralph was still working too, having been honored on NBC's *Today* as the oldest living realtor in the U.S.

Meredith and I had the privilege of celebrating several Thanksgivings with Ralph. Before we would start our Thanksgiving dinner, he would often say a few words that included how happy he was to continue experiencing life.



Ralph Cornell at 103 years of age.

Ralph also had a deep **passion for living**. This is a characteristic we have observed in *everyone* who maintains their motivation to optimize health when they are advanced in age.

Although he did not have a scientific or medical background, he figured out a natural way to extend his life through what's come to be known as **intermittent fasting**.

He also practiced **hara hachi bu**. A Japanese phrase meaning “eat until you're **80%** full,” this practice was developed by long-lived Okinawans who stopped eating when they began to feel full.

It was inspiring to spend time with Ralph and to adapt ideas from *his* natural approach to longer life to our own philosophy.

Community Support

It's hard to stay motivated on your own. As the CR Way has progressed, we've developed a **support group**. Members can come together by telephone and share their aging successes *and* challenges.

The support group provides some of the same personal interaction and support that we got from being with Ralph.

Everyone benefits from hearing how others achieve their goals and what holds them back. And when someone encounters a challenge, the group is ready to pitch in and help them solve it.

Finding Fun in Food

Eating right doesn't have to be a chore. We recently held a class on making healthy foods irresistible while *motivating* ourselves to look forward to the taste treats that meals provide.

It's important to plan healthful meals with interesting tastes and textures that delight you. While varying dietary intake is fun, it is also important for a healthy **gut microbiota**,^{2,3} which has been associated with positive emotions.^{4,5}

Your gut microbiota changes rapidly to adapt to the foods you eat. Enjoying a variety of raw and cooked vegetables helps make your microbiota more diverse.⁶

This morning I began my day with a **Farmers' Market Soup** made from a variety of fresh vegetables from a local organic farmer. The vegetables combine to make a rich, savory taste and their contrasting textures add interest.

It's delicious, *and* it is wonderful to know that the benefits of eating this way—better **glucose control** and a cardiovascular system that functions as if I were much younger⁷—will help me feel good all day.

Here's a recipe for the **CR Way Farmers' Market Soup**. The idea is to make it easy to enjoy a healthy variety of vegetables and sprouts in your diet, to develop a more diverse gut microbiome, and to have fun doing it.



Farmers' Market Soup*

Use this recipe as a template for a delicious soup made from the vegetables you get from an organic farmer. Substitute or add veggies you prefer.

One 115-gram serving, 23 Cal.
per serving. Prep time: 4 minutes

20 grams	One large leaf of kale, chopped to bite size
10 grams	Two green onions, chopped
15 grams	A few tablespoons mixed sprouts (Sprout Lady Rita)
50 grams	One stalk wild celery, chopped
20 grams	Fresh microgreen mix, your choice of amount

Directions:

Add $\frac{3}{4}$ pint to 1 pint water to a saucepan.

Add all the ingredients.

Bring to a boil and cook for two minutes.

Serve in your favorite soup bowl with walnuts, as desired.

* P. McGlothlin & M. Averill. *The CR Way to Great Glucose Control*, 2020.

This recipe can be changed on a regular basis, throughout the year, to include other fresh, organic ingredients that are in season.

WHAT
YOU
NEED
TO
KNOW

The Key to a Healthier Life

- To continue to live a healthy life well into older age, it's vital to stay **motivated**.
- There are a few key ways to achieve this. Being positive and passionate about life, finding support in a community, making healthy foods as tasty and fresh as possible, and getting enough sleep are just a few.
- Many people who have lived to be **100 years old** or more live by these tenets.



Contributing to the Greater Good

Another level of emotional satisfaction from eating this way is the joy of contributing to a better community.

By purchasing from a local organic farmer that we know and trust, we help a deserving person who works long, dedicated hours and does everything possible to preserve the land that their farm is on. We want to lend our support to people like that whose work makes a better community for everyone.

Unhealthy comfort foods may provide short-term pleasure, but they will increase your risk of age-related disease and shorten the time you have to spend enjoying this planet. Eating delicious, healthy meals will likely make it possible for you to enjoy the things you love far longer.

Long and Satisfying Sleep

Staying motivated takes energy. Every successful ager we have known **sleeps** as well as people in their 20s or 30s.

Sleep quality is often reported to decline with age.⁸ But it doesn't have to be that way. Strategies for better sleep are part of the *CR Way to Great Glucose Control*, the starter course for CR Way living.

Simply setting your **circadian clock** by walking outdoors in the early morning sunlight and at sunset⁹ is a good start toward getting better sleep. It can also increase mood-elevating neurotransmitters like **serotonin**¹⁰ and **dopamine**¹¹ and help you manage glucose levels more effectively.¹²

Emotional Empowerment

Satisfying sleep, delicious food, a healthy gut, and community support are all part of an approach to help people be happy naturally.

Happiness empowers you to make healthy lifestyle choices because you experience how good it feels to optimize your health. We encourage people to consult with doctors before embarking on major lifestyle or diet changes.

As I write this article, I'm looking out my window at the sun glistening off leaves of the trees in the woods. It's a beautiful day, the kind of day I hope to enjoy again and again. I can hardly wait to walk outside and set my circadian clock.

No one can predict the future, but I know that I'm grateful for what I have and imagine that you are grateful for the things you enjoy, too. If you have



read this article, it's likely you are motivated to make the effort to enjoy your life for as long as possible. It's worth it. ●

About The CR Way

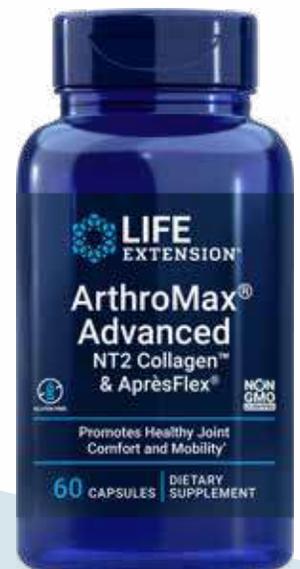
Paul McGlothlin and **Meredith Averill** wrote *The CR Way* (HarperCollins, 2008) based on decades of research showing that diet and lifestyle can produce favorable changes in genes and other aging biomarkers. They later created the online community Living the CR Way. They are currently collaborating with scientists at Harvard Medical School and The Forsyth Institute (supported by Zymo Research) to focus on the immune system, microbiome composition, and DNA methylation as gauges of aging interventions. To learn more about the authors and the CR Way, call 877-481-4841 or visit www.livingthecrway.com.

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Boron (calcium fructoborate as patented FruiteX-B® OsteoBoron®)	1.5 mg

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[‡] 3-O-acetyl-11-ketoB-boswellic acid.



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Debris



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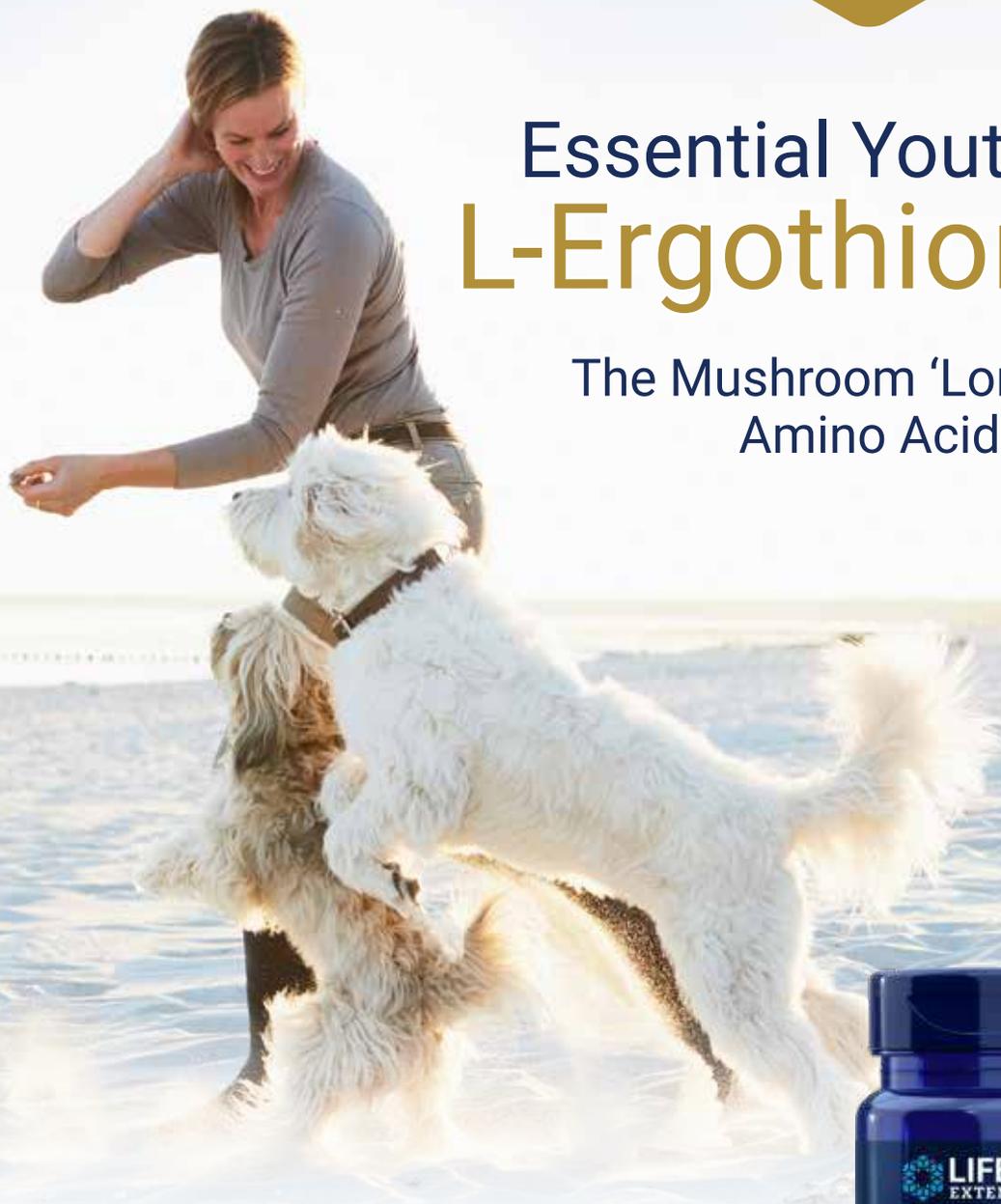
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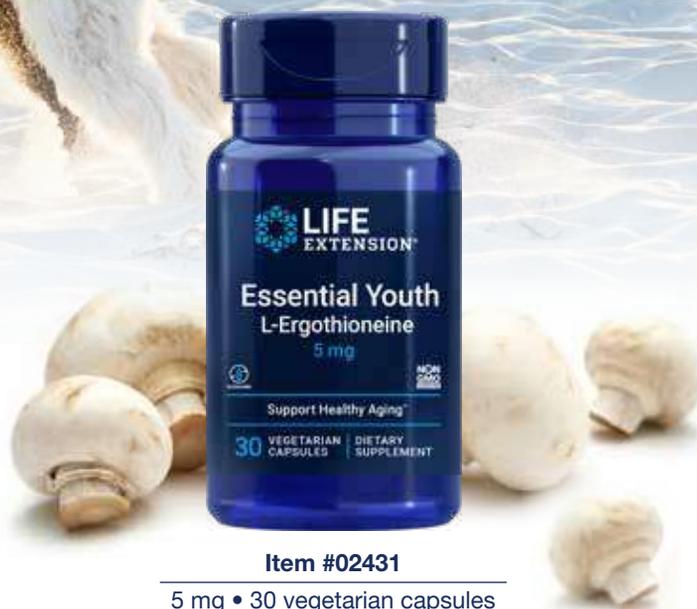
- Protecting against oxidative stress¹
- Delaying **telomere** shortening²
- Supporting **DNA function** in cells subjected to UV exposure³

One daily capsule of **Essential Youth** provides **5 mg** of **L-ergothioneine**.

This **5 mg** potency exceeds the **L-ergothioneine** contained in 2 cups of white button mushrooms, depending on growing conditions.^{4,5}

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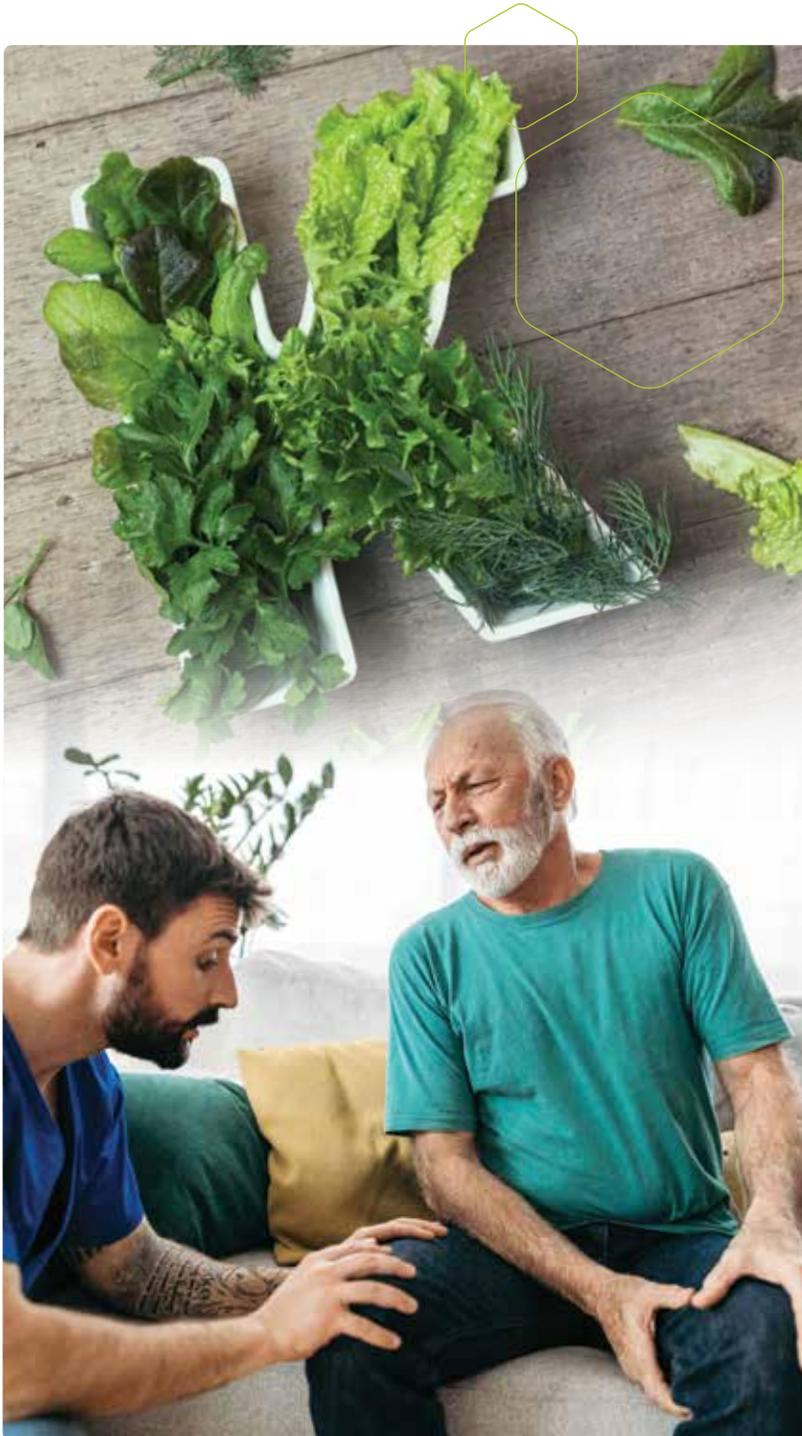
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VITAMIN K

BY LAURIE MATHENA



Vitamin K is best known for helping blood clot properly and for maintaining bone density.

Research continues to uncover its broad array of benefits.

Studies have been published showing that both forms of vitamin K—**K1** and **K2**—can impact everything from heart disease risk to cognitive function to all-cause mortality.

Here are the highlights:

- **Low vitamin K status raises all-cause mortality risk.**

A meta-analysis published in the *American Journal of Clinical Nutrition* that included 3,891 participants with an average **age of 65**, found that people with *low* levels of circulating vitamin K1 (**0.5 nmol/L or lower**) had a **19% higher** risk of **all-cause mortality** compared to those with levels **more than 1.0 nmol/L**.¹

- **Higher intake of vitamin K2 lowers coronary heart disease risk.**

In a study published in *BMJ Open*, researchers followed 2,987 people between 46-49 years old, for up to 11 years. After adjusting for factors like age, sex, and physical activity, they found that a *higher* dietary intake of **vitamin K2** was associated with a *lower* risk of **coronary heart disease**.²

- **Lower vitamin K levels linked to fracture risk.**

Researchers evaluated the associations between circulating vitamin K1 levels, fracture risk, and bone mineral density in postmenopausal women with osteoporosis. They found that vitamin K1 levels were significantly lower in the women who had suffered a fracture, and that vitamin K levels were independently associated with fracture risk. They also determined vitamin K's impact on fracture risk may be related to its effects on bone strength.³

In another study, researchers followed 12,794 people from 40 to 74 years old and found that lower intakes of vitamin K and calcium in women were associated with a higher risk of **vertebral fractures**.⁴

- **Vitamin K status significant for better cognition in older adults.**

In a study that included 500 older adults, researchers found that people with better cognition had significantly *higher* levels of dietary **vitamin K1** than people with the poorest cognitive function. Both dietary and serum levels of vitamin K1 were independent predictors of good cognitive function.⁵

- **Vitamin K helps reduce risk of type II diabetes.**

There's also growing evidence that *higher* intake and blood levels of **vitamin K** (in the form of both **K1** and **K2**) are substantially associated with reduced risks of developing type II diabetes.⁶ •

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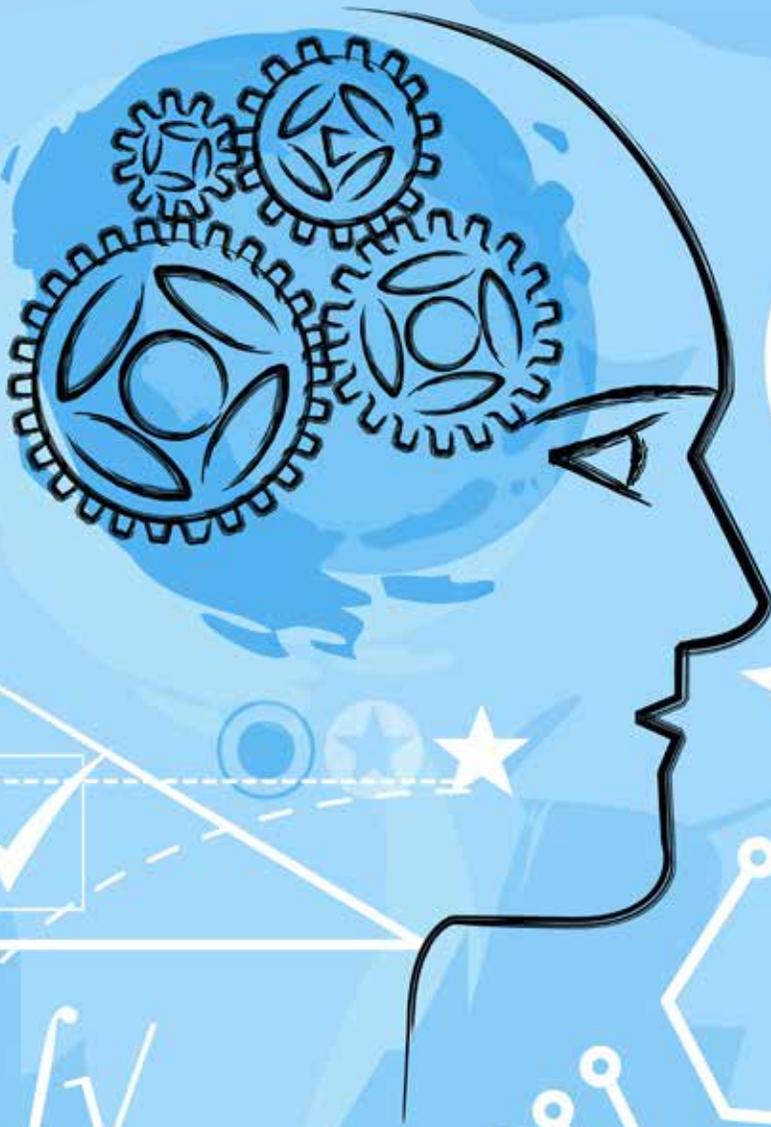


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Harvard Study: Eating WALNUTS May EXTEND Your LIFE

BY MICHAEL DOWNEY

Walnuts provide an array of health benefits.

New evidence suggests that *regular* walnut consumption may contribute to a **longer life**.¹

In a landmark study using data collected over **20 years**, scientists with **Harvard University** discovered a link between eating more walnuts and a lower overall **risk of death** among older adults.

This observational study found that 60-year-old Americans who ate **five or more servings** of **walnuts** per week lived roughly **1.3 years longer** than those who never ate walnuts.¹

They also had a **14%** lower risk of **death from any cause** and a whopping approximate **25%** lower risk of dying from **cardiovascular disease**.



Longer Lifespan

Walnuts contain healthy fats, fiber, vitamins, minerals, and many different compounds with proven health benefits.

Harvard research published in the journal *Nutrients* in **2021** now links walnuts to greater **life expectancy**.¹

Compared to people who never ate walnuts, consuming **five servings** of walnuts per week (with one serving being one ounce) resulted in:¹

- An approximate **1.3-year increase** in **life expectancy**, for 60-year-olds,
- A **14% lower** risk of death from any cause, and
- A **25% lower** risk of dying from cardiovascular disease.

Consumption of just **two to four servings** of walnuts per week also had clear benefits, resulting in:¹

- About a **one-year increase in lifespan**, for 60-year-olds,
- A **13% lower** risk of death from any cause, and
- An approximate **14% lower** risk of death from cardiovascular disease.

The study authors noted that even if your diet needs improvement, eating just **half an ounce** (a half-serving) of walnuts daily could lower the risk of death from any cause by **12%**.

Twenty Years of Study Data

The team from the **Harvard T.H. Chan School of Public Health** analyzed data from **67,014 women** enrolled in the Nurses' Health Study and **26,326 men** in the Health Professionals Follow-up Study. Participants had an average age of just over **63 years**.¹

All subjects had completed a survey on walnut consumption and were relatively healthy at the start of the average **20-year** follow-up period. Their diets were checked every four years. This allowed scientists to identify associations between varying levels of **walnut intake** and **life expectancy**.

It's important to note that the researchers found an approximate **1.3-year increase in life expectancy** associated with *higher* walnut consumption—among subjects who had *already* reached the age of **60**.¹

“Even a few handfuls of walnuts per week may help promote longevity,” noted lead investigator Yanping Li, PhD, “especially among those whose diet quality isn't great to begin with.”²



WHAT
YOU
NEED
TO
KNOW

Nutritional Powerhouse

Walnuts contain nutrients that play an important role in a healthy diet. One ounce contains **4 grams of protein**, **2 grams of fiber**, and **45 mg** of the mineral **magnesium**.³

They also contain **ALA (alpha-linolenic acid)**, an **omega-3 fatty acid** found in plants.³

ALA may improve **blood lipids (fats)**⁴⁻⁶ as well as the function of **endothelial cells** that line the arteries.⁷⁻⁹

Walnut consumption has also been associated with reduced **oxidative stress**.^{10,11}

These nutritional contents may help explain walnuts' contribution to healthy aging and longevity.

Walnuts' powerful effects on lifespan and risk of death may result from their ability to help inhibit many conditions that can shorten **lifespan**. These conditions range from high blood pressure and obesity to diabetes and cancer.

Heart Protection

Walnuts are believed to reduce the risk of **cardiovascular disease**.¹²

One possible reason is that walnut consumption is linked to a **reduction in blood pressure**, even among those with existing hypertension.¹³

The Benefits of Walnuts

- Harvard researchers analyzed 20 years of data on over 93,000 older men and women and found that those who ate a **one ounce** serving of **walnuts** five times a week lived roughly **1.3 years longer** than those who didn't eat walnuts.
- Those who ate **five** weekly servings of walnuts had a **14% lower risk of death from any cause** and a **25% lower risk of dying from cardiovascular disease**.
- Other studies suggest that walnut consumption may help protect against heart disease, control type II diabetes, and potentially help lower the risk of Alzheimer's disease and several types of cancer.



High blood pressure is a key risk factor for heart disease and stroke.

High **cholesterol** levels can also result in the development of vascular disease.

Preclinical data suggest that walnuts may *reduce* the production of **lipids** and *improve* blood lipid levels.¹⁴

In a randomized controlled trial, a diet enhanced with **1.5 ounces** of walnuts daily significantly reduced **fasting** levels of multiple atherogenic lipids and lipoproteins, including total cholesterol, non-HDL cholesterol, LDL-cholesterol, triglycerides, and apoB (apolipoprotein B).¹⁵

Another clinical trial of healthy adults between 63 and 79 years old showed that eating about **two ounces** of walnuts daily for two years.¹⁶

- Reduced total cholesterol, LDL and IDL (Intermediate Density Lipoprotein),
- Reduced total **LDL** particles number by **4.3%**, and
- Reduced total small **LDL** particles number (a *more dangerous* form of LDL) by **6.1%**.

Help Controlling Diabetes

Type II diabetes is dangerous for its potential long-term complications, including cardiovascular disease, chronic kidney disease, nerve damage, vision problems, and cognitive impairment.^{17,18}

Accumulating evidence suggests that walnuts and their components may help **lower blood sugar** and reduce the long-term health risks associated with diabetes.¹⁹

A human trial found that consumption of walnut oil daily for three months *lowered* blood sugar levels in diabetes patients by about **8%**. This held true for both the **fasting glucose** level and the **three-month** (HbA1c) blood glucose level.²⁰

A flavonoid in walnuts called **myricetin** has been linked to **antidiabetic** effects due to its ability to enhance the activity of an insulin receptor.²¹

Anti-Cancer Activity

Limited evidence suggests that walnut consumption may lower the risk of certain **cancers**.

In one lab study, **walnuts' peptide fractions** inhibited the growth of **breast cancer** cells by about **63%** and **colon cancer** cells by about **51%**.²²

Animal studies have found that feeding walnuts to mice inhibits the **development** of tumors and decreases tumor **growth** rate and **size**.²³

One analysis compared the estimated lifelong consumption of walnuts, peanuts, and almonds of **breast cancer** patients with people free from breast cancer. Compared to those with no consumption, those with *high* consumption had a **two to three times lower risk** of breast cancer.²⁴

Brain Health

Lab and animal studies show that compounds present in walnuts *reduce oxidative damage and inflammation in brain cells*.²⁵ In a mouse model of Alzheimer's disease, walnuts reduced oxidative damage to **lipids and proteins**.²⁶

In an animal model of **Alzheimer's disease**, mice were fed **walnuts** for about 10 months, a significant portion of their lifetimes. Compared to mice given no walnuts, they showed improvements in **memory, learning ability**, and more.²⁷

Additional research suggests that walnuts may also lower the risk or progression of other brain disorders, including **Parkinson's disease, stroke, and depression**.²⁸

Adding a handful of walnuts to your daily diet appears to be a simple way to improve overall health and possibly even extend your lifespan.

Summary

A recent, large study by Harvard University scientists found that 60-year-olds, eating **five weekly servings of walnuts**, had an approximate **1.3-year increase** in lifespan.

There was also a **14% lower** risk of death from any cause and a **25% lower** risk of dying from cardiovascular disease.

Some longevity benefits were found even with fewer weekly servings of walnuts.

Other studies suggest that regular **walnut** consumption may protect against hypertension, high cholesterol, diabetes, cancer, and Alzheimer's disease. ●

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SUPER K Item #02334

90 softgels



SUPER K ELITE Item #02335

30 softgels



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Item #02032

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Reference: **Gerontology*. 1996;42(3):170-80.

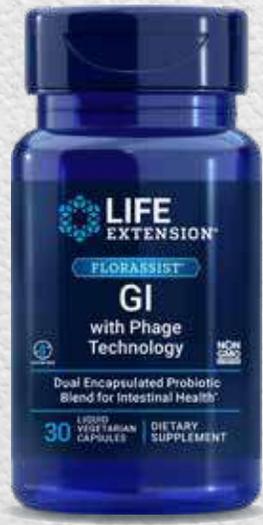
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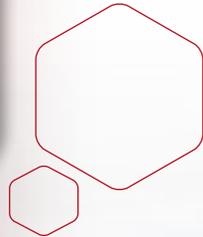
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The Science and Technology of Growing Young

BY SERGEY YOUNG



Can you imagine living to 100, 150, or even 200 years of age... and beyond? Better yet, enjoying those extra years while staying healthy, vigorous, and mentally adept?

In *The Science and Technology of Growing Young*, Sergey Young explains why this radical concept is not only possible, but inevitable.

It starts with the idea that **aging** itself is not an inescapable *process*, but a *curable condition*.

Unlike other longevity books that are viewed through the lens of a scientist or medical doctor, *The Science and Technology of Growing Young* was written by an investor-author with his finger on the pulse of dozens of companies on the cutting edge of longevity science.

In his latest book, Young shares his firsthand knowledge of these remarkable breakthroughs.

He identifies the **Near Horizon of Longevity**—those developments that will allow us to live to 150 (some of which are already in use, like gene editing and organ regeneration).

He also introduces the **Far Horizon of Longevity**—the future of age-reversal (including digital avatars and AI-brain integration) that could allow us to experience age 200 and beyond.

In addition to revealing the latest scientific discoveries and technological breakthroughs gathered from leading health entrepreneurs, scientists, doctors, and inventors, *The Science and Technology of Growing Young* provides practical advice for ways to live better right now for increased longevity.

Young believes that following these steps will help people live long enough to be able to take advantage of the latest technologies when they become available.

The following brief excerpts from *The Science and Technology of Growing Young* provide insight into Sergey Young's innovative thinking on achieving practical longevity.

—LAURIE MATHENA

TECHNOLOGICAL ADVANCEMENTS DRIVING THE LONGEVITY REVOLUTION

Scientists now understand far better than ever before the relationship between genes and aging.

And while our genes do not significantly change from birth to death, our epigenome—the system of chemical modifications around our genes that determine how our genes are expressed—does.

The date on your birth certificate, it turns out, is but a single way to determine age. The biological age of your epigenome, many longevity scientists now believe, is far more important.

Best of all, however, science is beginning to offer ways to alter both your genome and epigenome for a healthier, longer life.

New technologies like CRISPR-Cas9 and other gene-editing tools are empowering doctors with the extraordinary ability to actually insert, delete, or alter an individual's genes.

In the not-terribly-distant future, we will be able to remove or suppress genes responsible for diseases and insert or amplify genes responsible for long life and health.

GENE EDITING IN PRACTICE

The hereditary trait that causes sickle-cell anemia affects tens of millions worldwide, including as many as **30%** of sub-Saharan Africans, and up to three million African Americans.

The bone marrow of those with sickle-cell anemia produces abnormally shaped red blood cells that are unable to carry oxygen to the body. This often leads to fatigue, frequent infections, and sudden and excruciating bouts of pain.

Sickle-cell anemia also leads to premature death.

Victoria Gray was just three months old the first time she endured a sickle-cell attack. By the time she was 34 years old, the condition had already gotten so bad that she could no longer walk or feed herself.

Then one day, doctors at the Sarah Cannon Research Institute (SCRI) in Nashville, Tennessee, threw Gray a lifeline: she became the first patient to be treated with a new treatment called CRISPR-Cas9, a new form of genetic engineering.

Using this new technology, doctors at the SCRI removed bone marrow from Gray's body and altered the genes of her cells. The procedure effectively "edited" the defect, the way you might go through the lines of a book and correct typos or alter words.

Doctors then reintroduced billions of these enhanced cells back into her body to see if they would start doing their job properly.

One year after the treatment, Gray appeared to be doing marvelously.

While SCRI researchers hoped that at least **20%** of Gray's red blood cell system would be positively affected by the procedure, when they checked nine months later, the vast majority of bone marrow cells and hemoglobin proteins found in Gray's body appeared to be functioning effectively.

More importantly, her pain attacks and hospital visits had ceased completely!

While it is still too early to declare this procedure a cure for sickle-cell anemia, it has at least for the moment completely rehabilitated the life of Victoria Gray.

In laboratories around the world, gene editing is being used to tackle

Huntington's disease, Lyme disease, congenital blindness, and many more conditions.

When perfected, gene editing technology will have the ability to correct **89%** of the known hereditary human diseases.

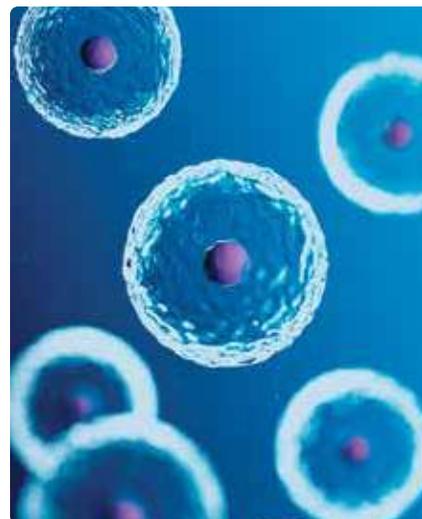
The FDA has stated that it expects to approve 10 to 20 new gene and cell therapies per year by the year 2025. This will drive the cost of gene therapy down and make it available for a wide range of health conditions.

CART-CELL THERAPY

Gene therapy works by effectively providing cells with genes that produce necessary proteins in patients whose own genes cannot produce them.

This process is already being applied to a few rare diseases, but it will soon become a common and incredibly effective medical approach.

Probably the most revolutionary area of gene therapy today is CAR T-cell therapy—a cancer treatment method by which scientists modify a patient's own immune-system T cells to fight the specific type of cancer they have.



These T cells are equipped in a lab with the antigen receptors they need to latch on to and kill cancer cells, based on the specific characteristics of the cancer cells. The T cells are then reintroduced to the body, where they destroy the cancer cells and then remain on watch for the cancer to return.

CAR T-cell therapy may very well end the scourge of cancer, which takes an estimated 10 million lives per year.

EXAMPLE

Emily Whitehead was the first pediatric patient to receive CAR T-cell therapy, when she was just seven years old. Emily was in hospice care—her last stand in a severe battle against leukemia.

Within a few days of receiving her highly experimental CAR T-cell therapy, the treatment started to work.

After a few weeks, she was in such strong remission that she was no longer considered terminal. Best of all, the CAR T cells remain on duty inside Emily to this day, remembering and watching for her cancer to come back, for the rest of Emily's life.

Hundreds more like her are alive today after receiving CAR T-cell therapy. It is as close to a “cure” for cancer as we have today, with up to **80%** of those receiving the treatment surviving.

IMPORTANCE OF EARLY DIAGNOSTICS

Early and accurate detection of diseases is the key to addressing the prevention of the “premature death” dimension of longevity.

Of the nearly 60 million lives lost around the globe each year, more than

30 million are attributed to conditions that are reversible if caught early.

We live in a world of “reactive medicine.” Most people do not have advanced batteries of diagnostic tests unless they're experiencing problems.

But not for long.

Soon, health care will move from being “reactive” to being “proactive.”

The key to this shift will be low-cost, ubiquitous, connected devices that constantly monitor your health.

Very soon, wearable, portable, and embeddable devices will radically reduce premature death from diseases like cancer and cardiovascular disease, and in doing so, add years, if not decades, to global life expectancy.

They will constantly monitor your heart rate, your respiration, your temperature, your skin secretions, the contents of your urine and feces, free-floating DNA in your blood that may indicate cancer or other disease, and even the organic contents of your breath.

EXAMPLE

After it was discovered that dogs can use their highly sensitive noses to detect cancer, UK firm Owlstone produced a handheld diagnostic mask that measures volatile organic compounds (VOCs) transferred from your blood to your breath.

This “breath biopsy” can diagnose inflammation, infectious disease, cardiovascular disease, metabolic conditions, and eight different types of cancer.

In a 2016 study of 2,500 smokers and nonsmokers, the Owlstone breath biopsy accurately identified 42 people with lung cancer. Of those subjects, **90%** had a curable, early stage of the disease.

SENOLYTIC LONGEVITY PILLS

Dr. Judith Campisi and others have pioneered a new class of potential longevity pills called senolytics, which target and destroy zombie senescent cells.

Cellular senescence is the natural process whereby cells reach their capacity for division and finally take themselves out of service. When senescence proceeds smoothly, expired cells are absorbed by the body and their useful contents recycled.

When they reach the end of their natural life cycle, they sometimes stick around in a kind of “zombie state” instead of being reabsorbed. They become inflamed and begin sending chemical signals to adjacent cells to also become zombies.

High levels of zombie cells in the body are linked to heart disease, diabetes, dementia, osteoporosis, kidney disease, liver failure, and lung conditions.

In studies by Campisi and other researchers, senolytic molecules like dasatinib and quercetin successfully destroyed these zombie cells in mice, subsequently curing or preventing age-related conditions in the lungs, cardiovascular system, bones, and kidneys.

The mice given these senolytics also lived **36%** longer than mice that were not.

In 2019, the Mayo Clinic's resident senescent cell expert Dr. James Kirkland released the results of the first clinical trial exploring the use of senolytics to treat age-related diseases in humans.

In a small, short study of just 14 patients with pulmonary fibrosis, dasatinib and quercetin improved the condition of the subjects in just three weeks.

Another Kirkland study, released later that year, showed that senolytic drugs indeed reduce the number of senescent cells in humans.

LONGEVITY SUPPLEMENTS

Berkeley biochemist Bruce Ames created a list of nutrients that he theorizes are needed for the body's most important undertakings. When there are enough of these nutrients in the body to go around, they are used to protect the body from aging.

But when there is a shortage, the body prioritizes immediate survival and reproduction over repair of damaged cells.

Of the 41 nutrients on his list, Ames thinks **vitamin D, omega-3, magnesium, quinone, and carotenoids**—are critical.

Quercetin and its senolytic sister **fisetin** are also both naturally occurring fruit flavonoids that are available over the counter as supplements.

Many supplements are probably good for longevity. I, myself, take **40 to 50** supplements per day.

PRACTICAL STEPS FOR LONGEVITY

First, early diagnosis is critical for the prevention of disease and age-related decline. This recommendation is not number one on my list by accident. I recommend that you get yourself checked regularly, and as comprehensively as possible, within your means.

At a minimum, you should have a complete annual physical exam that includes blood count and metabolic blood chemistry panels, a thyroid panel, and testing to reveal potential deficiencies in nutrients such as vitamin D, vitamin B, iron, and magnesium. If you are sexually active, you should also be checked for STDs.

Second, eat early, and less often. Awareness of the relationship between caloric restriction (CR) and longevity goes back to the 1930s, when Cornell animal husbandry professor Clive McCay discovered that rats who were underfed by **30% to 50%** not only became healthier than their normally fed littermates but they also lived **33%** longer.

These experiments have been successfully repeated in one form or another in worms, mice, rats, rhesus monkeys, and humans.

Caloric restriction predictably reduces common health problems like diabetes, cancer, heart disease, and cognitive decline. It reduces the likelihood of obesity and insulin resistance. It preserves immune system function.

And, in animal subjects, at least, it results in as much as an **80%** increase in lifespan.

LIVING TO 100

Living to at least age 100 is within reach for most people on the planet today.

In the United States, **50%** currently make it past 83 years old and **25%** past 90. In Japan, **51%** of girls and **27%** of boys born today are expected to reach 90.

Going forward, these numbers will only improve for anyone who follows a longevity-optimized lifestyle. The middle-aged today can still add 10 to 15 years of extra life, while for those in their twenties, adding up to an additional quarter century should be a piece of (sugar-free, low-carb) cake!

If you would like to stay alive longer, then my advice to you is to stay as healthy as possible for as long as possible, until you are able to take advantage of the next horizon of innovation. •

Reprinted with permission from BenBella Books, publisher of *The Science and Technology of Growing Young* by Sergey Young.

Sergey Young is a longevity investor and visionary with a mission to extend the healthy lifespan of one million people.

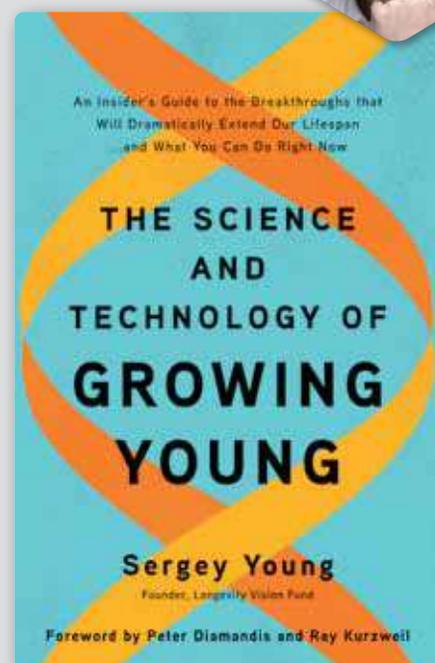
He is founder of the \$100 million Longevity Vision Fund, one of the few funds specializing exclusively in longevity and helping to accelerate longevity breakthroughs. He is also Development Sponsor of Age Reversal XPRIZE, a global initiative designed to cure aging and age-related diseases.

To order a copy of *The Science and Technology of Growing Young*, call 1-800-544-4440 or visit www.LifeExtension.com

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This product is available at fine health food stores everywhere.



*Br J Pharmacol. 2004 Mar;141(5):825-30.

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Share a Longer Life



Selenium promotes the body's production of **glutathione**, a potent cellular antioxidant. It also encourages healthy cell division, thyroid health, and immune function.

Super Selenium Complex combines three complementary forms of selenium with vitamin E for additional antioxidant protection.

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200 mcg • 100 vegetarian capsules

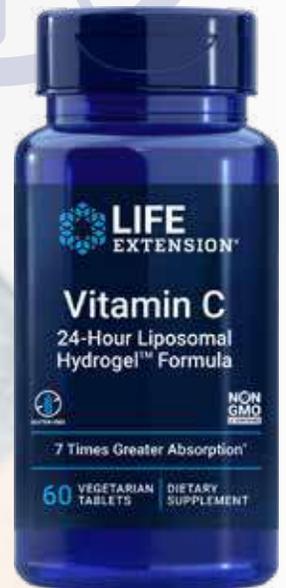
Each bottle provides a supply that lasts more than three months.

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HOURS
A DAY



"I feel better about my immune system with it."

Mary

VERIFIED CUSTOMER REVIEW

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VITAMIN

Buffered **ascorbate** encased in two plant extracts (liposomes plus hydrogel fenugreek) increases blood (plasma) exposure nearly **seven times more** compared to an equivalent dose of regular vitamin C.

It also maintains *higher* vitamin levels throughout the day.¹

Just **one** vegetarian tablet daily provides **around-the-clock** vitamin C support.

Item #02501

60 vegetarian tablets



This product is available at fine health food stores everywhere.

1. Akay Internal Study. Liposomal hydrogel vitamin C pharmacokinetics. Data on file. 2021.

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doesn't have
to be
exhausting.



We've designed **Youthful Woman 40+ with B-Complex** for women who feel low on energy and experience occasional discomforts that come with age. It has eight B vitamins to promote healthy energy levels and support overall well-being. Plus, we added a patented

Siberian rhubarb extract to help provide relief from common discomforts like the occasional hot flash, mood swings and general fatigue.



Item #02507
30 enteric coated
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Target that weight
around your
hips & waist

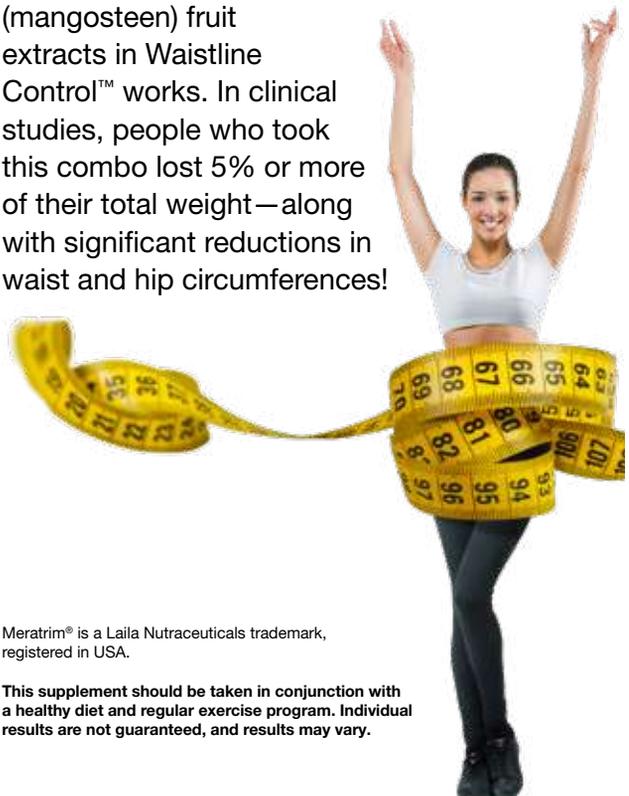


Item #02509
60 vegetarian capsules

We accumulate fat in different places—but typically we care most about the fat around our middles. Are you ready to lose those love handles? The Meratrim® blend in **Waistline Control™**, when combined with a healthy diet and regular exercise, can help you reduce your waist size and achieve a healthy weight.

The patented blend of *S. indicus* flower and *Garcinia mangostana*

(mangosteen) fruit extracts in Waistline Control™ works. In clinical studies, people who took this combo lost 5% or more of their total weight—along with significant reductions in waist and hip circumferences!



Meratrim® is a Laila Nutraceuticals trademark, registered in USA.

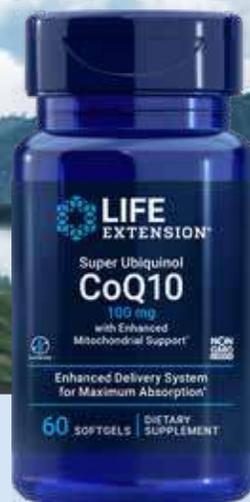
This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results are not guaranteed, and results may vary.

CoQ10

Fuel for Heart | Mind | Muscle

CoQ10 helps fuel energy production at the cellular level—and **ubiquinol** absorbs eight times better than standard CoQ10. This means you'll have the body energy you need to power your brain, liver, kidneys and heart.

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Item #01426

100 mg • 60 softgels

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Dandelion

BY LAURIE MATHENA

Dandelions are notorious for invading our yards every summer. But these pesky weeds are as nutritious as any vegetable growing in your garden.

Traditional medicine practices have been using dandelions for thousands of years to treat ailments ranging from acne to liver disease to digestive disorders.

Every part of a dandelion—the root, stem, and flower—is packed with nutrients that provide myriad health benefits.

The **root** is a good source of soluble fiber that helps support healthy gut bacteria.

The **flowers** contain polyphenols, which are plant compounds that could potentially help prevent blood clots, reduce blood sugar levels, and lower heart disease risk.

Animal studies have shown that dandelions **MAY/JUNE** help combat constipation by increasing stomach contractions and the rate of emptying the stomach contents into the small intestine.¹

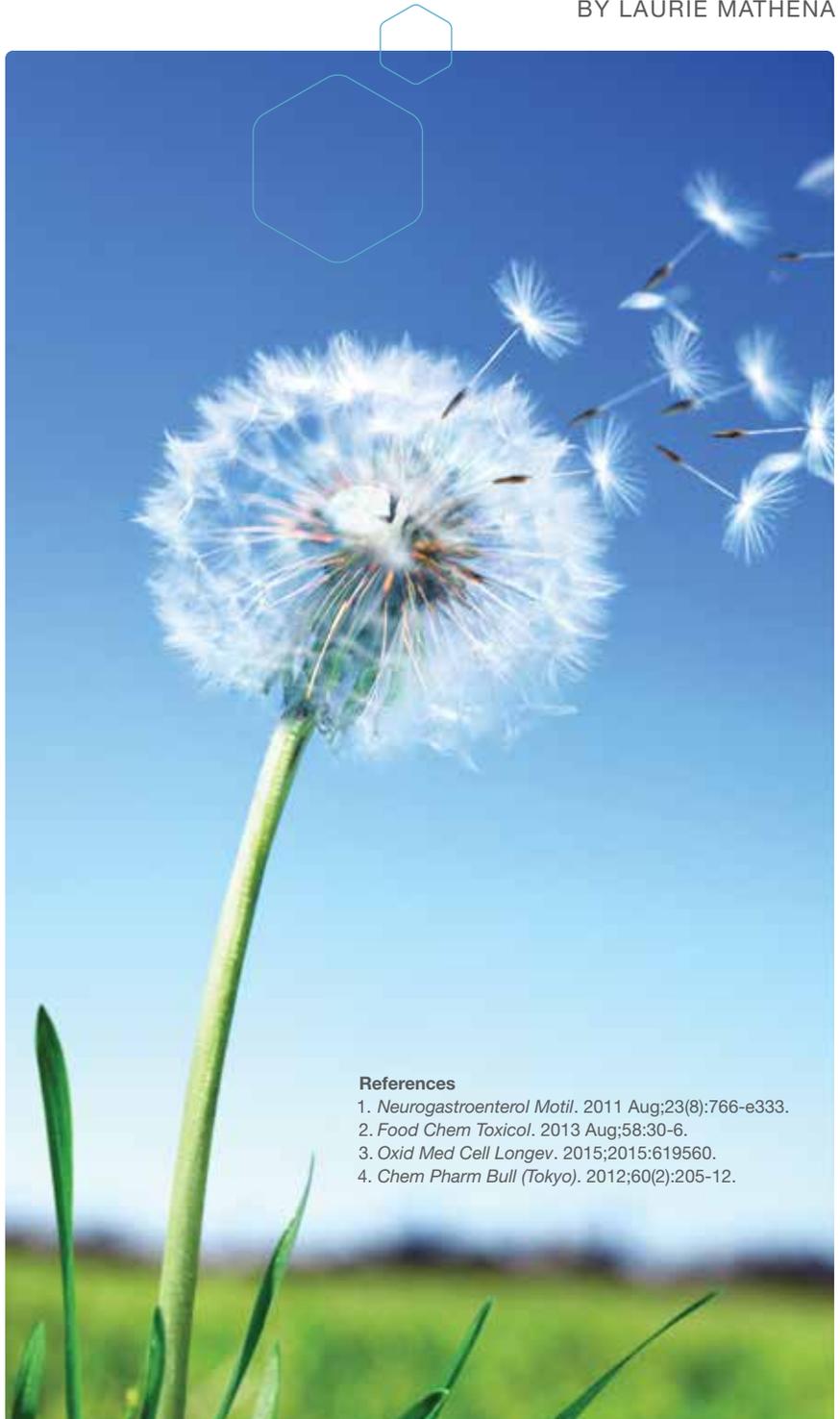
In another study, mice treated with dandelion extract experienced dramatically reduced **cholesterol** and **triglyceride** levels.²

Cell culture studies suggest dandelion extracts are also great for your skin.

Dandelion **leaf** and **flower extracts** have been shown to protect skin cells exposed to ultraviolet irradiation.³

And dandelion **root extract** can increase the generation of new skin cells, *which slows skin aging*.⁴

Dandelions are most often consumed as a supplement or tea. They are also safe to consume raw or cooked. •



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4. *Chem Pharm Bull (Tokyo).* 2012;60(2):205-12.



IN THIS EDITION OF *LIFE EXTENSION MAGAZINE*[®]



18 DEFEND AGAINST COLDS, FLU, AND ALLERGIES

Scientists have identified a **probiotic and yeast fermentate** that *reduced cold* and **flu** frequency by **55%**.



28 SOLUTION FOR BRAIN FOG

Two plant extracts restore **mental clarity, energy, and focus**.



36 TARGET BELLY FAT

Two plant extracts *reduced waist circumference* by an average of **4.7 inches** and **hip size** by an average of **4.1 inches** in clinical trials.



46 RESTORE HEALTHIER GLUCOSE LEVELS

Cinnamon, chromium, and seaweed help *reduce blood glucose* levels.



56 OVERLOOKED RISKS OF ELEVATED HOMOCYSTEINE

Elevated **homocysteine** blood levels contribute to brain aging, heart disease, and hearing loss.



78 HARVARD: EATING WALNUTS EXTENDS HUMAN LIFESPANS

Harvard scientists found that 60-year-olds who ate **walnuts** five times a week had a **1.3-year increase** in lifespan.